INFLUENCES ON THE ICT PRACTICES REPORTED BY SELECTED ESOL TEACHERS IN AOTEAROA NEW ZEALAND SECONDARY SCHOOLS

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In The Name of God

The material presented in this thesis is the original work of the candidate, does not incorporate, without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief does not contain any material published or written by another person except where due reference is made in the text.

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"At times, our own light goes out and is rekindled by a spark from another person. Each of us has cause to think with deep gratitude of those who have lighted the flame within us."
—Albert Schweitzer

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Abstract

This study investigates selected ESOL teachers' reported perceptions of the factors that influence their ICT practices in their professional life in New Zealand secondary schools. It aims to give voice to the ESOL teachers who have been historically marginalised in New Zealand secondary schools, and to inform other stakeholders, including the leadership in the schools and policy-makers, about ESOL teachers' concerns and challenges.

The primary data source was semi-structured interviews with 21 secondary ESOL teachers from around New Zealand. Professional conversations with some experts in the field and analysis of seven documents served as secondary sources of data to elucidate themes. A number of factors were reported by these teachers to influence their practice with ICT including: teachers' personal characteristics and confidence, the professional development that was available to them, the complexity of English language learners (ELLs) pastoral and language needs, and the organisation of the their schools.

The Arena framework of change with digital technologies (Davis, 2018) was used to provide detailed descriptions of the complex ecosystems in which three individual ESOL teachers were positioned. Each teacher was mapped at the centre of one Arena in their ESOL classroom with ELLs who had a wide range of linguistic and cultural backgrounds spanning migrants (including refugees), international fee-paying students, and overseas exchange students. The students had diverse linguistic, educational, and emotional needs. The ecological lens offered in Davis's framework clarified that these ESOL teachers were working in increasingly challenging ecosystems, and their reported behaviour as a member of the "keystone species" of teachers in these educational ecosystems evolved

over time and varied with the behaviour of interacting ecosystems, locally, nationally, and globally. Additional analytical tools and theoretical frameworks applied include Nations's (2007) second language pedagogical principles, SAMR (Puentedura, 2013) levels of ICT integration, and Davis's (2018) synthesis of concerns-based adoption models.

Change with ICT in ESOL classrooms is likely to continue to increase in complexity with the continuing co-evolution of ICT and education (Davis, 2018). This study demonstrates that New Zealand ESOL teachers face more challenges than has previously been recognised. The findings of this study also indicate that changes in ESOL teachers' ICT practices are not achievable without considerable effort over time from each ESOL teacher, professionally relevant ongoing PLD, and support from their schools and communities. These findings have implications for teachers, school leaders, providers of teacher education, and policymakers.

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List of Abbreviations

BYOD: Bring Your Own Device

CALL: Computer Assisted Language Learning

COW: Computers on Wheels

ELL: English Language Learner

ERO: Educational Review Office

ESOL: English for Speakers of Other Languages

FFP: Foreign Fee Paying (students)

ICT: Information and Communication Technologies

IELTS: International English Language Testing System

ITE: Initial Teacher Education

LMS: Learning Management System(s)

MALL: Mobile Assisted Language Learning

MOE: Ministry of Education

NCEA: National Certificate of Educational Achievement

NZC: New Zealand Curriculum

NZQA: New Zealand Qualifications Authority

PLD: Professional Learning and Development

SMS: Student Management Systems

TELL: Technology Enhanced Language Learning

TESOL: Teaching of English to Speakers of Other Languages

TESOLANZ: Teachers of English to Speakers of Other Languages Aotearoa, New Zealand

TPACK: Technological, Pedagogical, Content Knowledge

VLN: Virtual Learning Network(s)

Chapter One
Introduction

1.1. Introduction

This chapter introduces the context, focus, and scope of this PhD study. The research focuses on ICT practices of teachers of English for Speakers of Other Languages (ESOL) in New Zealand secondary schools, specifically high schools. The students in ESOL classes of teachers are immigrants, refugees, and international students from non-English speaking backgrounds. They are often referred to as "English Language Learners" (ELLs) and many of them are minority ethnicity students. A Ministry of Education (2006) report emphasised the value of ICT in providing minority ethnicity students with "high quality learning" and facilitating a "sense of identity, self-confidence, and key competencies, which are prerequisites for independent, collaborative, and lifelong learning" (p. 8). Later reports recognises that such competencies could be optimally developed through "digitally fluent teachers" (Ministry of Education, 2015c) and "appropriate pedagogy" (Ministry of Education, 2007). Similarly, Wright (2010) emphasises the central role of teachers in creating an effective ICT-rich pedagogy, remarking that "it is teachers who organise these spaces, resources, and opportunities for learning" (p. 25).

This study explores ESOL teachers' self-reported ICT practices and their perceptions of what influences those ICT practices. In this study the term ICT is used to refer to any kind of digital technology that is used for personal or professional purposes to manage information, assist with communication, and/or support teachers in their teaching and students in their learning. This includes, but is not limited to, classroom computers, management systems, software applications, and social media. Computer Assisted Language Learning (CALL) is at times used to specifically refer to the use of ICT tools for language learning purposes.

1.2. English Language Learners as priority learners

The Educational Review Office (ERO, 2012) defines priority learners as "groups of students who have been identified as historically not experiencing success in the New Zealand schooling system. These include many Māori [indigenous people of New Zealand] and Pasifika [migrants from the Pacific Islands and their descendants living in New Zealand] learners, those from low socio-economic backgrounds, and students with special education needs" (p. 4). Since 2012, particular emphasis has been placed on attending to the needs of priority language learners in order to enhance their educational performance and educational achievement in New Zealand schools. The educational success of priority learners is recognised as an important condition for the government's sustained vision of creating a prosperous and competitive economy and therefore helping these students to develop the skills required to fulfil their full potential is likely to contribute to the economy and society (e.g., Key, 2012).

Based on the above description from ERO (2012) and May, Cowles, and Lamy's (2013) report on ELLs' scores on the PISA 2012 survey of their reading literacy, mathematical literacy, and scientific literacy, ELLs can also be considered priority learners due to their record of low achievement, special educational needs, and/or their socio-economic background. New Zealand students who do not speak English at home, whether New Zealand born or immigrants, who are not achieving at an expected level in their education, need special language learning support to help them to access curriculum content at a year-appropriate level (May, Cowles, & Lamy, 2013; Ministry of Education, 2011a).

The term English Language Learner (ELL) has been widely adopted to refer to the students who are learning English in a country where English is the dominant language. A variety of terms have been used to refer to ELLs. These terms include ESOL students, Non-English Speaking Background (NESB) students, and English as an Additional Language (EAL)

learners. Although the term English for Speakers of Other Languages (ESOL) was formerly used to refer both to ELLs and the programme, it is now specifically used to refer to the programmes designed to support English language learners. While there is some critique in the literature about the deficit connotations of the term ELL (Webster & Lu, 2012), I have chosen to use this term since it is in current use in New Zealand Ministry of Education documents and among the New Zealand TESOL community.

English language learning is a prerequisite to ELLs' academic development and success (Franken & McComish, 2003). All ELLs are trying to integrate into a new learning milieu and, therefore, require individualised attention to overcome the social, cultural, linguistic, affective, educational, and economic challenges they experience (Perez & Morrison, 2016; Rjosk, Richter, Hochweber, Lüdtke, & Stanat, 2015). In such contexts, the students need specialised language instruction and assistance (Cook, 2015).

The need for special support for ELLs gains added relevance and urgency as the number of immigrants, refugees, and international students from non-English speaking backgrounds integrating into New Zealand schools is growing (Education Counts, 2017; Franken & McComish, 2003; Fry, 2014; Ministry of Education, 2002a). For instance, according to the Ministry of Education statistics, the number of international fee-paying students has risen from 16,065 students in the schools in 2010 to 20,240 in 2017 (Ministry of Education, 2019). The statistics from Ministry of Education's ESOL online database (TKI) also report on continuous rising number of ESOL-funded students from 32,306 students in 1,316 schools in year 2012 to 47,807 students in 1,485 schools in 2018.

The ELLs' linguistic and ethnic backgrounds varies widely and the number in each school ranges from over three hundred ESOL-funded students in one school to as few as one in a

single school (Ministry of Education, 2016). At the time of this research, ELLs included a wide range of students with different funding resources. They mainly fit into one of the three main types below:

1. Ministry-funded ELLs covers new migrants to New Zealand or students from a refugee background who need more intensive English learning support. Depending on their language assessment results, these ELLs are eligible for ESOL funding for up to five years (Ministry of Education, 2017a).
2. Foreign fee-paying (FFP) students are required to pay tuition fees to study in a New Zealand school. Some of these students aim to earn a recognised qualification, such as NCEA, and to prepare themselves for tertiary level studies. These FFP students provided up to 15% of the total tuition fee income in secondary schools (Ministry of Education, 2015a).
3. Exchange or short-term visiting students are the third main type of students in ESOL programmes. These students study at New Zealand schools for a short time; they are recruited through school-to-school (e.g., sister school) exchanges, as well as exchange programme organisations (EPOs) (Ministry of Education, 2015b) and they may or may not pay fees.

1.3. New Zealand schools and curriculum

New Zealand schools are mandated to follow the New Zealand Curriculum (NZC), developed initially in 1993 and later revised and published in 2007 by the Ministry of Education. The New Zealand Curriculum (NZC) (Ministry of Education, 2007) claims to address the essence of what education needs to do in the 21st century (Atkin, 2012). The NZC vision is to educate confident, connected, actively involved and lifelong learners (Ministry of Education, 2007).

Achieving such a vision involves considering values and accommodating key competencies within the curriculum learning areas, based on the principles offered by the curriculum (Atkin, 2012; Ministry of Education, 2007).

The NZC (2007) consists of eight levels. Most students pass through level one to four at primary school, and usually move from level five onward at secondary school. New Zealand secondary schools include five years of study and cover the average age range of 13 to 17 or 18. The National Certificate of Educational Achievement (NCEA) is the main recognised national qualification of student achievement levels (New Zealand Qualifications Authority, 2018). The NCEA consists of three levels. In order for the students to advance to the next level, they are assessed through their coursework and a number of standards. When they reach a certain level of accomplishment and gather enough credits, they are awarded an NCEA certificate. Through the successful completion of NCEA, students are able to gain entry into tertiary education.

The NZC has eight learning areas: English, Arts, Health and Physical Education, Learning Languages, Mathematics and Statistics, Science, Social Sciences, and Technology. Learning Languages is the term used for the learning area that encompasses the teaching and learning of languages other than English in the New Zealand Curriculum (Ministry of Education, 2007). Each of these learning areas has their own curriculum statement. For instance, the learning area statement about the language learning area discusses the nature of this learning area, why it is needed, how language learning should be addressed, what the proficiency descriptors and achievement objectives are for each level, and what pedagogical principles need to be followed.

Bolstad (2006) argues that being positioned within a learning area and, consequently, having a curriculum statement provides a subject with “status” and an “assessment tool”. Having status provides “consensus” and recognition about what the subject is about and, hence, it is possible

to for the NZC to frame or re-frame the ways teachers perceive that subject. However, ESOL is not covered under any of the eight learning areas and so ESOL teachers are in a different situation that could be viewed as a disadvantage.

1.4. Statement of the problem

The literature revealed few studies that identified ICT practices of ESOL teachers with a particular focus on the challenges they faced in content-based ESOL contexts where English is the language of instruction (see Section 2.5.2). The literature on ICT practices of English language teachers mostly referred to teachers of English as a foreign language (EFL) and rarely considers the very different conditions experienced in content-based ESOL in secondary schools. Where there was research (Andrei, 2017; Franco-Madrigal, 2016; Liu, Lin, Zhang, & Zheng, 2017), the findings were often restricted to a list of factors and failed to recognise the complex relationships between factors. Since there is a gap in the literature on understanding of the relationship between these factors, this study aims to address some of the challenges faced by ESOL teachers in a number of New Zealand secondary school ESOL contexts.

1.5. Purpose of the study

The purpose of this study is to explore selected ESOL teachers' ICT practices as a pedagogical tool with their ELLs in New Zealand secondary schools and to uncover the challenges that they might have faced in this regard by exploring the selected ESOL teachers' perceptions of the influences on their ICT practices. It aims to give voice to the ESOL teachers who have been historically undervalued in New Zealand secondary schools (Franken & McComish, 2003) and to inform stakeholders, including the leadership in the schools and policy-makers, about ESOL teachers' concerns and challenges. It also aims to provide a holistic picture of the complex ESOL ecosystems in which ESOL teachers work and in which they evolve their practices. It

aims to illustrate the complexity of the interactions between the layers of the educational ecosystems in which an ESOL classroom is nested through the use of the Arena of Change with digital technologies framework (Davis, 2018).

1.6. Research question

The three research questions that guide this study are:

1. What are the reported ICT practices of selected ESOL teachers in Aotearoa New Zealand Secondary Schools?

2. What are the selected ESOL teachers' reported perceptions of what influences their ICT practices in Aotearoa New Zealand Secondary Schools?

3. How do these influences interact and what are the relations and inter-relations among them?

1.7. Organisation of the thesis

This thesis is divided into seven chapters. This Introduction offers an introductory overview of the study and the thesis. Chapter Two reviews the literature on some of the available categorisations of the factors that influence teachers' ICT practices. It further reviews the literature on major influences on teachers' ICT practices, such as teacher knowledge, teacher learning, and teacher context. Chapter Three presents the research methodology and the design of the study. It discusses the research paradigm, the philosophical principles of the study, and the rationale underlying the selection of the methodology. It further introduces the analytical tools and theoretical frameworks employed in the study. It then proceeds to the method by describing the research setting and the participants, data collection techniques, data analysis processes, researcher positionality, research validity, and ethical considerations.

Chapter Four presents findings on the first research question. It focuses on teachers' self-reported ICT practices and describes how, why, and at what level ICT tools were employed by the twenty-one secondary ESOL teachers who participated in the study. It draws on Nation's (2007) second language pedagogical principles and the SAMR model (Puentedura, 2013) of levels of e-maturity to guide the analysis.

Using a thematic analysis approach, Chapter Five answers to the second research question. It elaborates on a number of influences (both positive and negative) that the selected ESOL teachers have identified as having an influence on their ICT practices including teachers' individual characteristics and their teaching context(s). Borg's (2015) model of teacher cognition frames these findings. Both primary (interview) and secondary (experts' opinion and documents) data sources are used.

Chapter Six answers to the third research question. It explains the relations and inter-relations between various influences via applying an ecological and holistic lens to change. By mapping three individual cases of ESOL teachers at the centre of Davis's (2018) Arena of Change with digital technologies framework, it illustrates the complexity of teachers' nested ecosystems with contrasts of their differences.

The final chapter of the thesis, Chapter Seven, first presents an overview of the key findings and then discusses them vis-à-vis the literature. The chapter is structured according to Davis's Arena framework. The implications of the findings and recommendations for stakeholders and researchers, as well as the limitations and possible directions for further research, are also presented.

Chapter Two
Review of Related Literature

2.1. Introduction

This chapter reviews the literature on the issues related to ICT integration in educational settings in general, and language learning contexts in particular. The literature on teacher ICT practices is broad both in terms of geographical spread and scope so, where possible, relevant research on language teaching was sought. Divided into eight sections, the chapter begins with a section on ICT in language learning contexts. This is followed by reviewing literature on different roles of ICT in educational and language learning settings. It then proceeds to introduce and elaborate some of the categorisations of factors that contribute to teachers' ICT practices.

The sections elaborate on some of the most commonly identified themes that influence a teacher's ICT practices, which include teacher cognition, teacher learning, and teacher teaching contexts. Borg's (2015) language teacher cognition model is used as a guide in the section on teacher cognition, which discusses issues such as teacher belief and teacher knowledge and their influence on teachers' pedagogy. This is followed by Nation's (2007) more nuanced framework for the teaching of languages based on theories of language learning. Issues of teacher learning and teachers' teaching context are also reviewed before the chapter concludes by summarising the most relevant literature that informed the design of the study. Recognising the need for more complex explanations, the review suggests considering a complex theoretical framework based on human ecology.

2.2. Language teaching and ICT

Harris and Hofer (2011) point to the importance of considering the content area in which ICT is to be used when planning for ICT integration in the schools. This is because content areas

have their own requirements and lend themselves differently to the use of ICT. Language learning appears to be aligned well with ICT. The rise of a specialised field in language learning called Computer Assisted Language Learning (CALL) and its constant update with the new developments in the field of educational technology such as Mobile Assisted Language Learning (MALL) and Intelligent CALL (ICALL) confirms the compatibility between ICT and the field of language teaching. This is evident in Braak's (2001) findings from a survey conducted on 800 secondary teachers from all the Dutch language speaking secondary schools in Brussels, which revealed that a higher proportion of language teachers made use of ICT tools than teachers in other learning areas. Similarly, more alignment of ICT with language teaching may be an explanation for why the level of ICT integration of languages teachers in Ham's (2008) study on a group of teachers on their ICT use, outperformed the teachers in other learning areas.

With the growth of CALL, approached and forms to its integration have also changed. Warschauer and Healey (1998) classified the advances in CALL into three main phases: structural CALL, communicative CALL, and integrative CALL. Warschauer and Healey (1998) further explain that Structural CALL is mainly based on behaviouristic theories of learning and the ICT are mainly in the form of "drill and kill" exercises. Communicative CALL is based on cognitive views of language learning which encourages implicit teaching of language forms. In this form, computers may play three main roles, i.e., as a tutor, a tool, or a stimulus. ICT designed for communicative purposes provides students with individual opportunities to learn and practise grammar, to improve listening, reading, and writing skills, and to enhance their vocabulary knowledge. Integrative CALL advocates for a socio-cognitive view to language learning, and emphasises authentic and meaningful use of language. It gain strength through the developments in multimedia and the Internet where ICT became an

integrated part of students' language learning process, and can be used in more authentic ways. While Bax (2003) appreciated Warschauer and Healey's (1998) classification, he has critiqued the classification for a number of shortcomings, including the overlap between the communicative and integrative phase; the lack of sufficient support and tighter reference, and finally the lack of clarity over the criteria for defining the roles of ICT in the communicative phase, i.e., whether "to be defined according to the wishes of its proponents, or to the software itself, or to the use of the software in class" (p.18). He further suggested an alternative analysis of CALL that restricted, open, and integrated CALL based on "the actual software and activity types in use at the time" (p. 20). He explained that the ideal or end goal for CALL is the stage of *normalisation* when ICT becomes invisible and its use is hardly noticed as an add-in in the classroom context.

Nunan (2010) explains that, the ICT integration models recommended for language learning classrooms are usually blended, i.e., they combine face to face activities in a traditional classroom with the virtual ones. He further describes four popular models of ICT integration available in a blended classroom. In the first model, "the traditional classroom is supported and supplemented by technology" (p. 206). In the traditional classroom content is delivered in the traditional way, and ICT is used to further support and add extra content and activities to the classroom. In the second model, "technology delivers the content and is supported by web-based live instruction". The third model is very similar to the second model, but with one major difference, i.e., instead of live web-based support, the students are provided with face-to face support. The fourth model he discusses is the "fully integrated classroom". In this model, the teacher is the facilitator, and "technology does what it does best", i.e., individualised study plans, anywhere, anytime instruction, a private space to make mistakes, immediate and individualised feedback, and detailed records of achievement (p. 206). However, while it

appears that Nunan (2010) highlights the fourth model as the optimal model, he also emphasises the importance of context and the purpose of instruction. He argues that there are certain purposes that virtual instruction may not be a suitable tool for, such as interactive learning in small groups, providing emotional support and diagnosing students' specific learning difficulties.

No research has been identified on how ICT is used in contexts similar to ESOL classrooms in New Zealand schools, nor what framework can be used to assess and evaluate that practice. More than 20 years ago, Chapelle (1997) indicated the need for research on how ICT is integrated, methods of ICT integration, the pedagogical tasks used, and value of ICT for different language teaching contexts. Lin, Wang, and Lin (2012), also consider evaluating the quality of teachers' ICT integration a remaining issue. They suggest that having a rubric could help teachers to evaluate their ICT practices and to check whether the ICT is pedagogically beneficial or not.

2.3. Roles of ICT in second language teaching

Various scholars have tried to offer classifications on the roles of ICT tools for the purposes of quality learning and teaching in educational settings (Davis, 2018). In search of a classification for the uses of ICT in second language learning contexts, Skorczynska, del Saz Rubio, and Carrió-Pastor (2016) provide an account of some of the most comprehensive classifications in the literature. They divided the available classifications in the literature into two types, i.e., whether the classification is focused on "the technology (software used) or their function in teaching" (p. 24).

For instance, Conole and Dyke (2004) provided a taxonomy of eight types of ICT tools used to support teaching and e-learning based on the functions of the ICT tools (e.g., 1. Tools for

manipulating text and data: word processing. 2. Tools for presentation and dissemination: the web and PowerPoint. 3. Tools for analysing data: SPSS and language processing systems, etc…). Laurillard (2013) classifies ICT tools based on their forms and the teaching strategies each offers in higher education into five categories (i.e., 1. Narrative: lectures, e-books, audio and video. 2. Interactive: web, blogs, and social networks. 3. Adaptive: simulations and tutorials. 4. Communicative: text, audio, video conferencing, discussion, Skype. 5. Productive: intranet).

However, none of the mentioned classifications are specifically based on the uses of ICT in second language learning contexts or linked with language learning theories, hence, these taxonomies may not be apt for the particular conditions of this field.

More specific to the field of second language learning, Nunan (2010) suggests three major roles for ICT in second language learning classrooms:

1. A carrier/provider of content and an instructional tool: "when the computer presents the learners with listening and reading input, and information on pronunciation, vocabulary and grammar, it is acting as a carrier of content" and "when the computer provides opportunities for learners to practice a language by doing spoken and written drills, completing comprehension questions, carrying out grammar exercises, and so on, it is acting as an instructional tool" (Nunan, 2010, p. 205).
2. A learning management tool: when they enable teachers to carry out management tasks, such as allowing teachers to administer and collate needs analysis data, allowing teachers to post course information, handouts and other material for students to download, etc….

3. A communication tool: When ICT tools such as emails, text chats, and voice chats enable learners to connect and communicate with native speakers of the language or with other learners for language learning purposes.

However, similar critique may be applied to Nunan (2010) as he neither explains the criteria and the research on which his classification is based, nor clarifies how the classification could contribute to and guide second language pedagogy.

Based on the shortcomings mentioned, it appears that a classification that takes into account both the functions of ICT as a tool and its applications in second language classroom pedagogy is needed. Skorczynska et.al, (2016) propose that these various classifications may be better combined with various pedagogical approaches to second language teaching for better understanding and integration of ICT tools. Similarly, Bugueño (2013) maintains that second language teachers are best able to integrate ICT when they are provided with some kind of activity type taxonomy such as Hofer, and Harris, Blanchard and Grandgenett's (2009) activity type taxonomy with its pedagogical and practical applications. This suggests a need for more empirical evidence of the pedagogical functions and roles of ICT in second language classrooms incorporating second language learning principles, which this study seeks to address. The factors that influence a teacher's ICT practices will be explained next.

2.4. Influences on the teachers' ICT practices

The literature on factors that influence teachers' ICT practices is broad both in terms of geographical spread and scope. These influences have been variously theorised by different scholars. However, the classifications appear to overlap considerably as in many instances, scholars have used a different terminology to refer to similar concepts or one classification is an extension of another one.

Pelgrum's (2001) research appears to be one of the most comprehensive, particularly in terms of the scope of the sampling. The study is based on a worldwide educational assessment sample from 26 countries. Providing international evidence, Pelgrum (2001) suggests that the most common obstacles to ICT integration in educational environments can be divided into material and non-material obstacles. The former includes obstacles such as a limited number of computers and a lack of proper software, while the latter refers to a lack of time, difficulty to integrate ICT in instruction, and a lack of or limited technical support staff.

One of the very first and most commonly referred to classifications on this topic is Ertmer's (1999). Influenced by Brickner (1995), Ertmer divides these factors into first-order or extrinsic barriers and second-order or intrinsic. Intrinsic factors pertain to the teachers themselves. They concern teachers' belief systems in terms of their pedagogy and practices and encompass "beliefs about teaching, beliefs about computers, established classroom practices and unwillingness to change" (Ertmer, 1999, p. 48). The extrinsic factors are those that are external to the teacher. These factors relate to institutional and equipment barriers, such as "lack of access to computers and software, insufficient time to plan the instruction, and inadequate technical and administrative support" (p.48). Both of these barriers are believed to impede the process of ICT integration in educational settings. However, the relationship between second-order and first-order barriers in this classification remains complicated (Sherman & Howard, 2012).

Later, in a review of the research on the barriers to the uptake of ICT by teachers in UK, Jones (2004) classifies the barriers into teacher-level and school-level barriers. Although Jones' (2004) classification seems to be very similar to that of Ertmer, they differ in the focus according to which the barriers are grouped, i.e., "Whether they relate to the individual … or to the institution" rather than being first-order or second-order barriers (Jones, 2004, p.20).

Another difference is their approach to the relationship between and within these barriers. While Ertmer (1999) believes that the first-order barriers need to be approached first, Jones (2004) emphasises the "complex interrelations between these two levels and between the barriers within those levels" (p.20).

By adding the system-level factors, Balanskat, Blamire, and Kefala (2006) move beyond Jones's school level as they consider the impact of barriers related to educational systems, such as rigid system structures, assessment methods, and restrictive curricula when reporting on the influence of macro-level barriers on the ICT integration in the schools in Europe. Based on a review of the literature mainly conducted in Europe, Balanskat et al. (2006, p. 54) categorise the factors into three levels, namely "micro" (teacher-level), "meso" (school-level), and "macro" (system-level) barriers. Teacher-level barriers include teachers' lack of ICT skills, lack of motivation and confidence, insufficient teacher training and lack of focus on pedagogical aspects, lack of follow-up of new ICT skills, and lack of differentiated training programmes. The school-level factors relate to the lack of appropriate ICT infrastructure and access to ICT and limited support from management. Although the categorisation proposed by Balanskat et al. (2006) appears to be more comprehensive by adding in another layer through differentiating between meso and macro levels, their definition of each barrier and the level on which it is located is not always as clear-cut as it initially appears. This makes it difficult to keep the categories and the hierarchies associated with them distinct. Furthermore, their definition of macro barriers is limited and excludes influences such as of policy makers, politics and government initiatives or other possible global influences. In addition, the categorisation does not discuss the relationship and interrelations within these various factors and levels.

Zhao and Frank (2003) and Davis (2018) critique such categorisations, because they are difficult to apply in practice; instead they emphasise the interdependence and complexity of

the interrelation amongst these factors. They maintain that not only did the approaches to the investigation of factors affecting ICT integration not capture the dynamic nature of ICT adoption and integration, but they may also inaccurately imply a simple and consequential relationship among the levels. Zhao and Frank (2003) explain that these factors have often been "examined in isolation from each other or from the system in which they interact. Rarely are they studied together under a framework to sort out their relative importance and to identify the relationships among them" (p. 809). Hence, an ecological approach was suggested by Zhao and Frank (2003) and Davis (2018) as a possible solution to explaining and clarifying the influences on teachers' ICT practices and their complex contexts. The concept of context encompasses the broadest sense of the word in an ecological perspective and it includes all the "physical, social, cultural, and historical aspects of context (including trends at the local and global level such as globalisation, urbanisation, and large scale environmental change) as well as attributes and behaviours of persons within" (McLaren & Hawe, 2005, p.6). This will be discussed in more detail in Section 3.3.1 on the theoretical framework of the study.

Due to the shortcomings of such categorisations discussed above, and the extensive overlap between them, none of the above categorisation was adopted in this presentation of the literature below. Instead the major themes discussed in the literature are followed. This review is also guided by Borg's definition of teacher cognition.

2.5. Teacher cognition

The most frequently cited factor in the literature concerns teachers and their thinking, beliefs, attitudes, and knowledge, which is referred to by Borg (2015) as "teacher cognition". Although this theme is discussed first, it is not possible to keep teacher cognition distinct from "the teachers' immediate and wider contexts of work, their personal biographies, and experiences" (Tsui, 2011, p. 25). Those themes are presented later.

Also there appears to be no clear distinction between the terms teacher knowledge and belief, and they are often being used interchangeably in the research (Richardson, 1996; Pajares, 1992). This is illustrated in Alexander, Schallert, and Hare's (1991) definition of the concept of knowledge as "all that a person knows or believes to be true, whether or not it is verified as true in some sort of objective or external way" (p. 317).

Researchers such as Borg (2015), Verloop, Van Driel, and Meijer (2001), and Woods (1996) have viewed belief, attitude, and knowledge as interwoven constructs and suggested that no clear distinction between these terms is possible, especially in empirical research. In the field of language teaching, Borg (2015) refers to these three mental constructs as "teacher cognition" and defines it as the "unobservable cognitive dimension of teaching – what teachers know, believe, and think" about different aspects of their work (p. 81). He further explains that language teacher cognition encompasses the mental lives of teachers and concerns the process and shaping of "beliefs, knowledge, theories, attitudes, assumptions, conceptions, principles, thinking, [and] decision-making about teaching, teachers, learners, learning, subject matter, curricula, materials, instructional activities, self, colleagues, assessment [and] context" (Borg, 2015, p. 283). Hence, teacher cognition is used as an overarching term for teacher belief, attitude, and knowledge. Teacher cognition influences all aspects of a teacher's work including a teacher's pedagogical practices and behaviour in their classrooms (Borg, 2015), and this also includes their ICT practices.

In the following sections, I elaborate on the literature which discusses teacher beliefs (2.5.1) and teacher knowledge (2.5.2), keeping in mind that these constructs are interwoven and interrelated.

2.5.1. Teacher beliefs

Belief is a very broad term, which has been variously defined by scholars. Haney, Lumpe, and Czerniak (2003) have defined teachers' beliefs as "one's convictions, philosophy, tenets, or opinions about teaching and learning" (p. 367). Teachers' beliefs are developed over time and gain strength as they become reinforced by subsequent experiences (Keys, 2007; Pajares, 1992; Richardson, 2003). As such, they include a teacher's earlier life experiences as a classroom student as well as their later experiences as a classroom teacher (Borg, 2015). Teacher pedagogical and self-efficacy beliefs are aspects of teacher belief which have been consequently referred to in the literature, particularly when teachers' ICT practices are discussed (Abbite, 2011; Ertmer, 2005). Hence, the influences of a teacher's pedagogical and self-efficacy beliefs and the relation between them and a teacher's ICT practices are worth further review.

Pajares (1992) identifies beliefs about curricula and materials, beliefs about students, and beliefs about the role of teachers in the education process as the main constructs of teachers' pedagogical beliefs, influencing what teachers teach and how. Teachers' belief systems have a profound impact on their teaching practices and their choice of classroom material and instruction tools (Borg, 2015; Johnson, 1992).

Other researchers have recommended that the process of change with ICT in schools should start with the understanding and appreciation of teachers' beliefs and attitudes towards ICT (Ertmer & Ottenbreit-Leftwich, 2010; Keys, 2007; Prestridge, 2012). Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur (2012) refer to teachers' existing attitudes and beliefs about ICT as major barriers to or motivators of teachers' ICT integration. Even with the same equipment, teachers with different beliefs towards instruction usually have very different perspectives on ICT integration and, accordingly, achieve different outcomes (Hodas, 1996; H.

Liu, Lin, & Zhang, 2017; Windschitl & Sahl, 2002). One of these beliefs concerns teachers' pedagogical approaches to teaching and learning (Tondeur, Braak, Ertmer, & Ottenbreit-Leftwich, 2017). There is a tendency in the literature to classify teachers' pedagogical beliefs as constructivist versus explicit or direct instruction teaching. The former integrates ICT to support a student-centred syllabus and the latter takes a more teacher-directed, task-oriented stance in their ICT use (Andrew, 2007; Belland, 2009; Ellis, 2005; Hermans, Tondeur, Braak, & Valcke, 2008). Rosenshine (1989) describes direct instruction as:

> …teaching activities where goals are clear to students, time allocated for instruction is sufficient and continuous, coverage of content is extensive, the performance of students is monitored, questions are at a low cognitive level…and feedback to students is immediate and academically oriented. In direct instruction, the teacher controls instructional goals, chooses materials appropriate for the students' ability, and paces the instructional episode. (as cited by Ellis, 2005, p.119)

However, as Ertmer and Ottenbreit-Leftwich (2010) suggest, it would be naïve to polarise teachers' ICT practices based on their pedagogical approach. This is because there is no clear-cut division between these two approaches to teaching and learning, and teachers may hold both beliefs to varying degrees. It appears that ICT integration is most beneficial and most effective when it is rooted in a learner-centred pedagogical design and is implemented in a student-centred environment (C. Kim, Kim, Lee, Spector, & DeMeester, 2013).

In teacher-directed educational environments, teachers are accustomed to being administrators and sources of knowledge and the ultimate authority in the classroom. Hence, teachers' fear of the loss of such authority appears to create a sense of resistance towards the application of ICT into their teaching (Fang & Warschauer, 2004; Finley & Hartman, 2004; Gilbert & Kelly, 2005). Similarly, Overbay, Patterson, Vasu, and Grable's (2010) survey study of 474 teachers

from 22 schools from elementary to high school in North Carolina in the United States indicated that teachers who had more experience with student-centred approaches to teaching and strongly acknowledged information technologies as beneficial tools for their teaching practices, were more likely to implement ICT in their teaching. Other studies, particularly those conducted in the language teaching field, also highlight similar results. For instance, results from a mixed method study of 126 English language teachers teaching English as a foreign language in higher education in Taiwan emphasise the direct influence of teachers' constructivist beliefs on their ICT integration (Chen, 2011).

Teachers' beliefs about the pedagogical benefits of ICT integration for their students also influence their ICT use in classroom. The more firmly teachers believe in the value of ICT for the students, the more they are likely to incorporate ICT into their practices (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010). Ertmer et al. (2012) found that the ICT practices of 12 exemplary teachers were highly influenced by their beliefs about the relevance of ICT to their students' learning. Other studies with stronger focus on language teachers' practices also confirm the interplay between beliefs, context, and practices.

Teachers' beliefs can be considerably influenced by context (Altınsoy & Okan, 2017; Borg, 2011). Tondeur et al. (2017), in a review of the literature on the links between teachers' ICT use and their pedagogical beliefs, emphasises the importance of context-related factors, such as lack of time, curriculum, assessment, and professional learning and development (PLD) in forming teachers' beliefs and their practices: "The relationship between teacher beliefs and educational innovations, such as ICT integration, is complex and therefore any outcomes from an identified change are likely to be produced through an involved chain of events" (p. 571). These factors will be discussed in the following sections.

Altınsoy and Okan (2017) conducted a survey study developed from data collected from interviews with 210 English language teachers teaching English as a foreign language in schools in Turkey. The questionnaire was based on six main themes: policy-oriented contextual factors and teachers' practices; inspection-oriented contextual factors and teachers' practices; classroom-oriented contextual factors and teachers' practices; student-oriented contextual factors and teachers' practices; school management-oriented contextual factors and teachers' practices; and teacher-oriented contextual factors and teachers' practices. The findings indicate that, except for school management-oriented contextual factors, a strong relationship existed between the English language teachers' various context-related factors, their beliefs, and consequently their practices. However, the study falls short of explaining how these various factors relate and interact.

Another dimension of teacher beliefs concerns teachers themselves and how they perceive their own ability to integrate ICT. Bandura (1997) refers to this as *self-efficacy* and defined it as an individual's belief of their own qualifications and capacity to complete tasks they are expected and required to perform in a specific area. A person's attitude towards a phenomenon and their choice of activities is greatly influenced by their perceived sense of self-efficacy (Bandura, 1997). The stronger a teacher's sense of self-efficacy is, the more they are inclined towards experimenting with new teaching methods and providing their students with new learning opportunities (Tschannen-Moran & Hoy, 2001).

Teachers' self-efficacy beliefs influence their pedagogical beliefs. Hsu's (2016) study, which examined 152 kindergarten and primary teachers' beliefs about ICT integration, highlighted a direct relationship between the teachers' constructivist pedagogical beliefs and their self-efficacy beliefs around their level of ICT practices and use. Hsu's results illustrated a strong relationship between the teachers' self-efficacy beliefs and their level of ICT integration and

use. Those teachers who held high self-efficacy beliefs had a constructivist (student-centred) approach in their pedagogy and integrated ICT at a higher level and with greater frequency than those with lower self-efficacy beliefs. Furthermore, they found that teachers perceived ICT most useful in the Language Arts area and for purposes such as improving students' reading, writing, and grammar skills. However, there was no explanation on what may have influenced teachers' self-efficacy beliefs.

Literature has also reported on the direct influence of the teachers' self-efficacy beliefs on their pedagogical approach to teaching, and their ICT use. Delgado (2018), for example, conducted a mixed method study on the relationship between elementary teachers' self-efficacy beliefs and the instructional methods they select. The results from Delgado's analysis of a survey, interviews, and observations indicated that teachers' use of ICT tools in their classroom was strongly influenced by their self-efficacy beliefs about the instructional use of ICT. Differentiating between knowledge and belief, Ertmer and Ottenbreit-Leftwich (2010) highlight the importance of teacher confidence, i.e., their belief in their ability to use ICT for instructional purposes as influential in their classroom practices, arguing that "although knowledge of ICT is necessary, it is not enough if teachers do not also feel confident using that knowledge to facilitate student learning" (p. 261).

The significance of teachers' perceived expertise in using computers, their ability to keep pace with technological updates, and how they gather ICT skills and solve technical problems has been frequently referred to in the literature (Boulter, 2007; Gilbert & Kelly, 2005; Hodas, 1996; King, 2001; Veen, 1993). The findings in this area are somewhat contradictory. For instance, a qualitative study conducted through interviews with ten second-language teachers in Canada by Lam (2000) suggested that other factors, such as their personal beliefs about perceived benefits of ICT, were more influential than fear of ICT. However, since all the participants

were Lam's colleagues, participants' responses may have been biased to avoid embarrassment. In contrast, Ertmer et al. (2012) point out the influence of teachers' fear of ICT and their perceived lack of ability in using ICT tools on their ICT use: "Teachers don't use technology because they are intimidated by it" (p. 429). A much earlier study by Goodwyn, Adams, and Clarke (1997) acknowledged the fear factor as they categorised English teachers in their study, based on their beliefs about ICT, into three main groups of "the fearful", "the unresolved", and "the optimist" (p. 54). They explained that the "fearful" group generally held negative beliefs towards ICT, regarding it as a source of anxiety and threat, hence reluctant to use ICT. The "unresolved" were the group of teachers who were in the transforming stage and the "optimists", were the advocates of ICT. However, regardless of the contradictory results in this area, when it concerns the language teachers' computer self-efficacy beliefs, studies which discuss in-service teachers' point of views and actions are rare. The research in this area is prominently conducted on pre-service teachers' computer self-efficacy beliefs (Liu, & Kleinsasser, 2015).

Various factors appear to influence computer self-efficacy beliefs. These range from teachers' knowledge about ICT and pedagogy, to their personal characteristics and demography. Paraskeva, Bouta, and Papagianni (2008) investigated the relationship between teachers' computer self-efficacy and the subject matter area taught, prior experience, exposure to and training in ICT. The results from their survey of 286 Greek secondary school teachers with a range of different subject areas revealed a strong and positive correlation between the above mentioned variables and teachers' computer self-efficacy. Prior experience in ICT appears to have the strongest correlation and the highest impact on teachers' computer self-efficacy beliefs. Paraskeva et al. (2008) also refer to the possible impacts of some of the teachers' characteristics associated with adult learning issues, such as their prior teaching experiences,

values, and attitudes towards their computer self-efficacy. This was a valid concern, since similar research confirms the impact of teacher demography, such as age, on older people's computer self-efficacy. Demographic factors such as age are also seen to affect teachers' technological competence and their self-efficacy beliefs. A study by Cooper-Gaiter (2015) on older adults' ICT use revealed that computer self-efficacy beliefs had a profound impact on older adults' intention to take up and use ICT tools. Research on teacher demographic factors also reveals that younger and less experienced teachers are more inclined to use ICT in their teaching compared to older teachers with more teaching experience (Jacobsen & Lock, 2004; Y. Liu, Theodore, & Lavelle, 2004). Inan and Lowther's (2010) survey study of 1382 K-12 teachers in Tennessee public schools indicated that teachers' age and years of teaching experience were negatively correlated with teachers' ICT proficiency and ICT integration. Other researchers have also referred to the role age plays in creating a digital divide in developed countries, particularly as economic factors and challenges related to access and affordability are becoming less inhibiting in the employment of computers (Nägle & Schmidt, 2012). However, it is worth mentioning that such outcomes may not just be the result of age, but an outcome of other factors which may relate to age, including prior schooling and professional training. Borg (2015) emphasises the interplay between teacher cognition and the teacher's prior schooling, professional training, and contextual factors in classroom practice. This will be described in more detail in the following sections. In summary, teacher belief is a complex and multi-dimensional concept which is influenced by various factors. In this section I have referred to the critical role of teacher pedagogical beliefs and self-efficacy beliefs on their ICT practices. These beliefs can vary and are influenced by teachers' past learning experiences, their working contexts and their knowledge (Borg, 2015). Relevant teacher knowledge can alter teachers' beliefs, improve their self-efficacy beliefs, and support them for effective ICT integration (Abbitt, 2011). This will be discussed next.

2.5.2. Teacher knowledge

Many labels have been used in the literature to refer to a relevant aspect or component of teacher knowledge (Tsui, 2011; Verloop, Van Driel & Meijer, 2001). Amongst others, Schon's (1987) conception of reflective practice and his concepts of knowing-in-action, reflecting-in-action and reflecting-on-action has contributed to the development of types of the teacher knowledge that is mainly the product of the teachers' practical experience and reflection on their experiences (e.g: Grimmett & MacKinnon, 1992;). Borg (2015) also emphasises the influential role of teacher experiences, whether as a student, a prospective teacher, or a teacher in the development of teacher cognition. Tsui (2011) presents a comprehensive account of the history of teacher knowledge development in the field of second language learning. He explains that the need for a shift from focus on general teacher knowledge base to a specific second language teacher knowledge base is discussed by Freeman and Johnson in 1998. They proposed a tripartite framework focusing on the teacher as the learner, the pedagogical practises, and the social, cultural, and institutional context of teaching. In the same year, Richards (1998) introduced six domains for second language teacher knowledge, covering what Freeman and Johnson proposed with an added component of subject matter knowledge. These dimensions included general theories of teaching; teaching skills; communication skills; subject matter knowledge; pedagogical reasoning and decision-making; and contextual knowledge.

Shulman's (1986) work identifying the various forms of knowledge that he views as essential for teaching has been particularly influential in the development of the concept of teacher knowledge. He highlights several domains of a teacher's knowledge base: subject matter or content knowledge; curriculum knowledge, with particular grasp of the materials and programs that serve as ' tools of the trade'; knowledge of learners and their characteristics; knowledge of educational contexts; knowledge of educational ends, purposes, and values, and their

philosophical and historical grounds; and general pedagogical knowledge, with special reference to those broad principles and strategies of classroom management and organisation that appear to transcend subject matter or content knowledge. Finally, he is best known, perhaps, for identifying pedagogical content knowledge (PCK): "that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding and comprises the ability of the teacher to transform what they know, taking account of the learner and the context, into representations and presentations that make sense to their students." (Shulman, 1986, p.8).

Content knowledge is of particular emphasis in language teaching. Borg (2015) challenges the common belief that "one's status as a native speaker of a language in itself qualifies one to teach it" (p. 81). He criticises the general tendency to believe that every person who knows a language can teach that language, elaborating that "knowing a subject is insufficient as the basis for teaching that subject skilfully" (p. 81). Similarly, Hubbard (2008) cautions against relying on teachers' generic language ability as the only criteria for teaching in the language learning area and argues for the field of language learning "as a unique field that should be wary of relying too much on generic educational criteria" (p. 3). Research also draws attention to the importance of discipline-specific teacher knowledge, differentiating between the teachers' general knowledge and content-specific knowledge. This is discussed further in relation to ICT in Section 2. 5. 2. 2. on Technological Pedagogical Content Knowledge (TPACK).

In relation to Shulman's (1986) concept of PCK, it is useful to recognise that Brown (1993), Ellis (2005), and Nation (2007) developed a set of principles to support second language teachers in their pedagogical knowledge. Drawing on an earlier longer list (Nation, 1993), Nation (2007) maintains that his set of pedagogical principles in second language teaching is

comprehensive and “can usefully be compared with the other lists of principles” developed by the authors mentioned earlier. Therefore, the following section introduces and elaborates on Nation’s (2007) principles for language teachers before elaborating how second language teachers who are planning to integrate ICT in their teaching can benefit from Nation’s principles.

2. 5. 2. 1. Nation’s principles for language teachers

Nation’s (2007) set of ten principles is built on four main strands and the idea that a well-designed course includes an equal proportion and an even balance of all four strands, i.e., 1. Meaning-focused input; 2. Meaning-focused output; 3. Language-focused learning; and, 4. Fluency development. Nation advised language teachers to categorise the activities in language learning courses in order to ensure coverage of the four strands.

Nation further discusses that the meaning-focused input strand emphasises the learners’ need to receive large quantities of comprehensible messages conveyed through viewing, listening, and reading, such as extensive reading and watching video clips. He stresses that it is important that the learners mainly read or listen to what they are already familiar with, with a maximum of five, but preferably just one or two new words per hundred words. Learners also need to be interested in the input and try to understand it using their background knowledge and context clues.

In contrast, meaning-focused output involves the development of language through producing meaningful language via speaking and writing, such as having conversations with peers, writing a diary, or telling a story. The same conditions that apply to meaning-focused input also apply to meaning-focused output when designing and selecting course activities. In other words, the learners talk or write about something already familiar to them, with the main

purpose being to convey their message. Nation recommends using dictionaries, previous input, or communication strategies to compensate for gaps in their knowledge.

Language-focused learning involves focusing on form and learning through deliberate attention to language features such as spelling, vocabulary, and grammar. Intensive reading, translation, pronunciation, and grammar practice are some examples of this strand. The fluency strand concerns scaffolding and reinforcing what is already learnt by the learner through extensive practice of all four language learning skills, i.e., listening, speaking, reading, and writing. Developing speed and reinforcing learning through mutual interactions is the aim of this strand. Speed reading, or repeated retelling of a story, are examples of activities for this strand. Nation also provides some practical suggestions on how the principles could be put into practice.

According to Nation (2007) every activity in a language learning course is believed to fit into one of these strands and through balancing these strands, "innovative changes such as using computer assisted language learning" can successfully take place (p. 11). However, research on applications of Nation's pedagogical principles in second language teachers' ICT practices is very scarce. Cunningham (2017) aims to guide teachers as to how ICT can be used to apply Nation's language learning classroom pedagogical principles in a flipped classroom. Table 2. 1 presents Nation's principles (Nation, 2007, p. 10-11) and shows how they have been interpreted in flipped pedagogy by Cunningham (2017, p. 45-46).

Table 2. 1: Interpreting Nation's principles in flipped pedagogy (Cunningham, 2017, p. 45-46, with permission)

Principle	Nation's suggestion	Flipped suggestion
1. Provide and organise large amounts of comprehensible input through both listening and reading.	This could involve providing an extensive reading programme, reading to the learners, getting learners to give talks for their classmates to listen to, arranging spoken	Language teachers have always asked learners to read material before class. They can also be tasked with extensive listening outside class time, of audiobooks (adapted for learners or full-

	communication activities and interaction via the internet.	text), podcasts (general interest or about language), and viewing video material.
2. Boost learning through comprehensible input by adding a deliberate element.	Note words on the board as they occur in listening, do consciousness raising activities before communicative tasks, get learners to reflect on new items they met while reading and explain problem items that come up in the context of communication activities.	Some pre-task consciousness raising activities can be done through videos before class. Learners can be asked to identify problem items in any pre-class viewing, listening or reading.
3. Support and push learners to produce spoken and written output in a variety of appropriate genres.	Use communication activities in a range of situations, use role plays, match writing and speaking tasks to learner needs.	While speaking will generally be an in-class activity, shy students will benefit from recording their speech privately, in free talking activities that can best be done out of class.
4. Provide opportunities for cooperative interaction.	Do group work involving split information, opinion gaps and information gaps, and get learners to work together on writing and reading.	Usually, this will be in class, but learners may enjoy meeting online before class to prepare a piece of collaborative writing, e.g., in GoogleDocs.
5. Help learners deliberately learn language items and patterns, including sounds, spelling, vocabulary, multiword units, grammar and discourse.	Do teacher-led intensive reading, give feedback on writing, deliberately teach language items and arrange individual study of language items.	Free writing (not for sharing) at the start of class can be liberating and a way to ask learners e.g., to write what they remember about the last lesson, or a text. Language Perfect or Duolingo or similar can incentivise individual study.
6. Train learners in strategies that will contribute to language learning.	Work on guessing from context, dictionary use, word part analysis and learning using word cards.	Videos on these strategies could be prepared for the learners to view before class and/or as needed.
7. Provide fluency development activities in each of the four skills of listening, speaking, reading and writing.	Run a speed reading course, include repeated reading, provide an extensive reading programme, do 4/3/2 activities, organise a regular ten-minute writing programme and do listening to stories.	Extensive reading, once established, can be done outside class. Listening to stories together is, however a good use of class time if integrated with interaction between learners.
8. Provide a roughly equal balance of the four strands of	Keep a record of the activities done in the course, the strand	The pre-class activity is a tool to help up the quantity of

meaning-focused input, meaning-focused output, language-focused learning and fluency development.	they fit into and the amount of time spent on them.	input. Teachers may want to prioritise oral production in class, though this can be part of meaning-focused output, language-focused learning and fluency development.
9. Plan for the repeated coverage of the most useful language items.	Focus on high frequency items, use controlled and simplified material and provide plenty of input at the same level.	Materials developed for flipped pedagogy can be rewound and re-viewed as required.
10. Use analysis, monitoring and assessment to help address learners' language and communication needs.	No suggestion is given.	If learners' pre-class activity is monitored and assessed, it can serve as an ongoing needs analysis.

Table 2.1 illustrates some possible second language classroom activities based on pedagogical principles. Cunningham (2017) also presents how teachers' knowledge of technology and pedagogy can be integrated to create flipped classroom activities in a language learning course. Koehler and Mishra (2009) refer to this knowledge as technological pedagogical content knowledge (TPACK) and this model is presented in next section.

2. 5. 2. 2. TPACK

One of the more influential theoretical frameworks in relation to school teachers' adoption of ICT is TPACK. It is built upon Shulman's (1986) construct of pedagogical content knowledge (PCK), with the aim of understanding the knowledge base teachers need to effectively teach their subject content using ICT (Koehler & Mishra, 2009). Figure 2.1 presents the TPACK framework and the connections between and amongst its components. The dotted circle indicates a simple notion of teachers' contexts in TPACK.

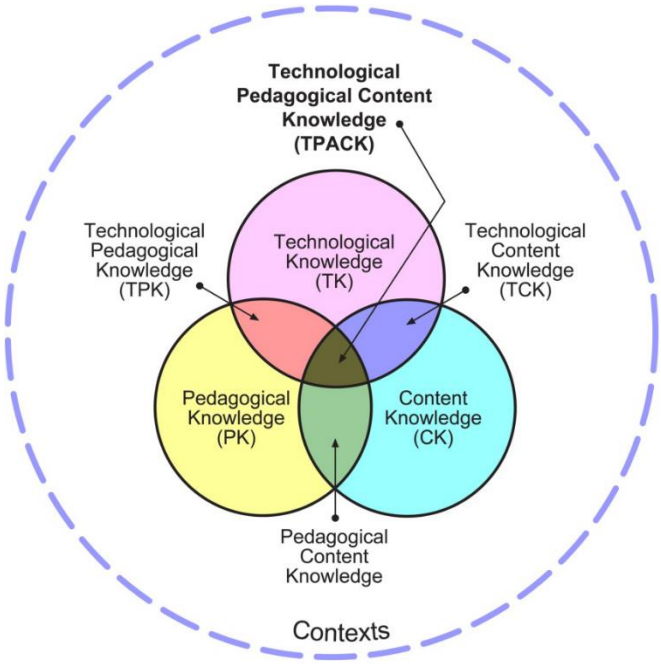

Figure 2. 1. TPACK framework (adapted from http://tpack.org)

The TPACK framework consists of three main bodies of knowledge, i.e., teachers' knowledge of content (CK), teachers' knowledge of pedagogy (PK), and teachers' knowledge of technology (TK). However, the framework is not confined to these three components as separate entities. The interactions between and among these components are equally important. These are presented as pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical knowledge (TPK). Hence, TPACK as a whole, emerges from the "knowledge that goes beyond [the sum of] all three core components" (content, pedagogy, and technology) (Koehler and Mishra, 2009, p.66).

Content knowledge (CK), at the bottom right of Figure 1, is defined by Shulman (1986) as "the amount and organization of knowledge per se in the mind of the teacher" (p. 9). It concerns the *subject matter knowledge*, specific to the discipline and what the teacher needs to learn and teach (Koehler & Mishra, 2009). A lack of comprehensive content knowledge may result in teachers' lacking the ability to teach and elaborate on the content (Koehler & Mishra, 2009).

Richards, Li, and Tang (1998) hold that "without a thorough knowledge of the content of teaching, teachers will have difficulty turning content into appropriate plans for teaching" (p. 99).

Richards (1998) describes the knowledge of subject matter for second language teachers as "what second language teachers need to know about their subject—the specialised concepts, theories, and disciplinary knowledge that constitute the theoretical basis for the field of second language teaching" (p. 8). Tsui (2011) in her review of teacher education and teacher development, elaborates on the concept of second language teachers' knowledge of subject matter as "teachers' knowledge of the underlying systems of language (including phonological, lexical, grammatical, and discoursal features of L2), and their meta-linguistic knowledge" (p.28). Andrews (2007) and Borg (2015) prefer the term *subject matter cognition* over subject matter knowledge due to the strong link between teachers' subject matter knowledge and their beliefs about how the subject matter should be thought, which are influenced by teachers' past and professional learning experiences.

However, the field of language teaching is vast and diverse, so that the kind of subject knowledge a second language teacher needs to master and teach varies depending on the purpose of the language course. For instance, *content-based language teaching* (also known as *content and language integrated learning*–CLIL) requires the integration of several different kinds of content knowledge.

Lyster (2011) in his review of content-based second language teaching proposes different classifications of language learning classrooms, including content-based instruction programmes, and the diversity in the type of content that should be covered within each approach. In content-based instruction programme, be the teaching content-based foreign language instruction (Pessoa, Hendry, Donato, Tucker, & Lee, 2007), or content-based second

language instruction (Duff, 2001), the "non-linguistic content, including subject matter such as social studies or mathematics, is taught to students through the medium of a language that is not their first, so that while they are learning curricular content they are also learning an additional language" (Lyster, 2011, p. 611). In content-based second language programme settings, the learner is "learning a language other than their first language in a country where the language being learned is widely used for communication" (Nunan, 2010, p. 204). The content of teaching in this approach focuses on some information about the subject matter and the language and vocabulary of that subject area that students are more likely to encounter (Echevarría, Vogt, & Short, 2008).

The content and the pedagogical approaches to content-based instruction in second language teaching contexts also vary. Consequently, the subject matter knowledge of the teacher and instructional content may also vary depending on whether it is more of a content-driven program or a language-driven one (Lyster, 2011; Met, 1998). A typical content-based classroom material "involves using texts that are written for native speakers of English" and "typically have the same vocabulary characteristics as unsimplified texts" (Nation & Webb, 2011, p.632). Hence, the content taught is different from General English or conversation courses. The content and skills in general language learning courses typically cover the "use of vocabulary from a range of frequency levels likely to be familiar to native speakers" of that language as well as general communicative skills (Nation & Webb, 2011, p.632). This varies from the content-based instruction programmes in which in addition to general and most frequent vocabulary, "the occurrence of a large number of words that occur only once in the text, and the occurrence of a topic-based technical vocabulary" is also covered (Nation & Webb, 2011, p.632).

The range of diversity in the purpose(s) of a language learning course and the type of content which needs to be covered indicates that the content knowledge that a language teacher needs to have varies in different language classrooms. However, it appears that reference to this aspect is sometimes ignored in the case of language teaching research, so that there is no clear reference to the kind and the purpose of the language learning course. For example, Bugueño, 2013 does not discriminate between ESL/EFL classrooms in his article on using TPACK to promote effective language teaching. This may be due to lack of sufficient research on the kind of content knowledge that language teachers in different language instruction programmes require. Hence, it is important to acknowledge this diversity and recognise the kind of the knowledge of subject matter/content which a language teacher needs. This study aims to shed light in this area.

Pedagogical knowledge (PK), shown at the bottom left of Figure 2.1 refers to the generic and non-subject matter/content-specific knowledge that every teacher should possess regardless of the content s/he is teaching. It includes knowledge of classroom management and organisation, encompassing knowledge about general teaching and learning theories, lesson planning, student learning, and assessment (Shulman, 1986; Koehler & Mishra, 2009). In addition to general pedagogical knowledge that every teacher should possess, the teaching of different content and disciplines may require a different pedagogy. Hence, which is the pedagogical content knowledge of pedagogy is presented next.

Pedagogical Content Knowledge (PCK) is an important component of TPACK where the knowledge of pedagogy and content combine, as seen at the bottom of Figure 2.1. In line with Shulman's notion of pedagogical content knowledge, Koehler and Mishra (2009) have defined PCK as the application of the knowledge of pedagogy to the presentation of a specific content area. PCK, therefore, refers to "an understanding of how particular topics, problems, or issues

are organised, represented, and adapted to the diverse interests and abilities of learners, and represented for instruction" (Shulman, 1986, p. 8).

PCK forms an important part of teachers' knowledge concerning classroom activities. Bugueño (2013) recognises a need for a set of concrete and practical principles that could guide teachers on their PCK knowledge, i.e., "what should be taught, why it should be taught, and how it should be taught" (Bugueño, 2013, p. 34). Within relation to this need, it is useful to recognise that Nation's (2007) set of pedagogical principles presented earlier draw on research on instructed second language acquisition. The integration of technology with this pedagogy entails a need for a comprehensive knowledge of the tools of ICT and of the specific pedagogy of applying them within a specific content area.

Technological Knowledge (TK) is seen at the top of Figure 2.1, is an added component to PCK which focuses on the knowledge of technology. Emphasising the ever-evolving nature of technology, Mishra and Koehler (2009) describe technological knowledge as the knowledge of how to effectively use, manage, and maintain technological tools. One of the major arguments put forward has been the differentiation between the uses of ICT for living purposes versus learning purposes (Waycott, Bennett, Kennedy, Dalgarno, & Gray, 2010). These authors use *living purposes* to refer to the most common applications of ICT tools in people's daily lives, such as writing emails, downloading music and movies, and social networking. The use of ICT for learning purposes, however, referred to the utilisation of ICT tools in academic and educational environments for academic ends, such as collaborative projects, problem-solving, and critical and creative thinking skills (Waycott et al., 2010). Thus far, then, several studies have argued that familiarity with the application of ICT tools in the context of everyday life does not necessarily equate to its use for learning purposes nor its integration in school environments (Kennedy, Judd, Churchward, & Gray , 2008; Kirkwood & Price, 2005).

Technological Content Knowledge (TCK), presented at the intersection of TK and CK in Figure 2.1, indicates that the use of technology is content-dependant and, as such, it is necessary to have the knowledge of how to use technology to present content. Technological content knowledge refers to the "knowledge about the manner in which technology and content are reciprocally related" (Mishra & Koehler, 2006, p. 1028). Baran, Chuang, and Thompson (2011), and Bugueño (2013) define it as a kind of knowledge of ICT that helps with the analysis and selection of a technology which best suits the representation of the subject matter. In the case of second language teaching, this knowledge would concern the knowledge of the tools that can be used for second language teaching and learning purposes, such as learning and teaching of grammar, vocabulary, and pronunciation (Bugueño, 2013).

Technological Pedagogical Knowledge (TPK), shown at the intersection of TK and PK in Figure 2.1, concerns "knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies" (Koehler, & Mishra, 2009, p.65). Koehler and Mishra (2009) maintain that such knowledge is salient since the majority of ICT tools are designed for purposes other than pedagogical ones. Teachers need to think creatively and direct its use towards pedagogical purposes. TPK helps the teachers understand and utilise ICT to "carry out particular tasks in combination with pedagogical strategies" (Bugueño, 2013, p. 34). In the field of second language learning, where communicative competence is the main aim of the language classroom, technological pedagogical knowledge would be conceptualised in a manner to more specifically highlight "the teachers' knowledge of how to adapt technology in language activities that promotes communicative competence" (Bugueño, 2013, 34). However, this conceptualisation may vary in content-based instruction since as discussed above, the focus differs.

Technological Pedagogical Content Knowledge (TPACK) is developed from the interactions between content, technology, and pedagogy knowledge components and is seen at the centre of Figure 2.1. It can be defined as the knowledge base needed for the effective use of ICT for the presentation of the subject matter/content via an appropriate pedagogy in the classroom (Koehler & Mishra, 2009). Bugueño (2013) defines English language teachers' TPACK as the "knowledge that permits them to integrate technology in the language class" based on the tasks to be accomplished, skills to be learnt, and the content to cover (p.45). An example of the integration of pedagogy and content with technology is Cunningham's (2017) illustration of how Nation's (2007) second language pedagogical principles can be used with ICT to help with the development of a flipped language classroom (see Section 2. 5. 2. 1).

Other studies have also emphasised the content-specific nature of teaching with particular emphasis on ICT integration, highlighting the relation between teachers' general knowledge, subject area knowledge, and ICT practices (Howard, Chan, & Caputi, 2015; Zhao & Frank, 2003). Studies on the importance of content and context in the application of ICT into different subject areas have identified what are called "culture clashes" amongst subject areas, which are "attributed to core features, values and beliefs held in the subject area" (Howard et al., 2015, p. 360). As part of a study of the Digital Education Revolution initiative in Australia, Howard et al. (2015) investigated 3624 secondary teachers' ICT practices, using a questionnaire. They arrived at the conclusion that the teachers' practices with ICT differed based on the learning areas they taught, explaining that every subject area has its own conventions and expectations for learning, or in other words, its own pedagogical content knowledge.

Context, the dotted circle in Figure 2.1, is the last part of the TPACK framework within which different knowledge components develop. TPACK emphasises the importance of the

knowledge of context as an indispensable part of what teachers need to know in order to teach effectively and efficiently with ICT. However, it is not clear what is meant by context or how it should be approached. On occasions, Mishra and Koehler refer to the "multifaceted and dynamic classroom contexts" as a container (Koehler & Mishra, 2009, p. 67), and on others they refer to it as knowledge of parental concerns, school social networks, and particular students (Koehler & Mishra, 2009). The issues with the importance of the context and its diversity are elaborated further on Section 2.7.

2.5.3. The simplicity of TPACK framework

The simplicity of TPACK framework has been critiqued in a number of ways including, TPACK's perspective on cultures, teacher knowledge and teacher context. One of the most relevant here is by Adam (2015), who critiques TPACK for its lack of recognition of the importance of cultures. This is since culture is a complex term and difficult to conceptualise and its definition varies depending on the theoretical approaches taken (Groseschl & Doherty, 2000; Ilieva, 1997; Velez-Agosto et al, 2017).

Adam (2015) explains that technology adoption and integration models including TPACK have failed to attend to the relationship between each teacher's cultural beliefs and their practice. In her ethnographic study of 11 teacher educators' technological and pedagogical practices in the Maldives, Adam concluded that the professionals' background, their cultural norms, past learning experiences, and their workplace context influences the ICT practices. She offers Pedagogical and Technological Cultural Habitus (PATCH) as an additional layer in the TPACK framework and suggested that the framework can help to identify the aspects that need consideration when investigating each teacher educator's technological pedagogical practices and planning for professional development programs. Bourdieu (1977), refers to habitus as a set of dispositions and tendencies which influences ones actions and decision making process.

A person's habitus develops throughout life and it is influenced by a person's life conditions and prior experiences. This implies that the people who share similar life experience, have similar habitus. Based on the definition of the concept, a teacher's previous life experiences, previous schooling and education influences their habitus or their disposition towards certain decisions and actions.

Acknowledging the significance of each teacher's past learning experiences in his review article, Belland (2009) also recommends the use of Bourdieu's (1977) theory of Habitus as a framework to explore and encourage K-12 teachers' ICT integration. Inspired by Bourdieu (1977), Belland critiques the focus on "post-teacher education barriers" to explore teachers' ICT integration behaviour and suggests that more attention needs to be paid to each teacher's "folk pedagogies [which are] formed through home and K-12 schooling experience" (2009, p. 362). The recognition of the influence of students' and teachers' culture on teachers' practices appears to be of particular importance in language learning classrooms since language is more than a means of communication. In fact, it reflects culture and, as such, serves as major transmitter and creator of culture (Brown, 1986). Hence, teaching and learning of another language involves socialisation and understanding a new worldview (Harrison, 1990).

How Mishra and Kohler (2009) conceptualise TPACK, i.e., as an outcome rather than an evolutionary process has been another point of criticism. Swallow and Olofson (2017) maintain that TPACK should be conceptualised as a knowledge constructing process when planning to observe teacher behaviour and explain how teachers are interacting with changes in the context and new knowledge. Swallow and Olofson (2017) argue that if understanding and conceptualising teachers' TPACK knowledge is the aim, there is a need to acknowledge the "constellation of multilevel factors that affect teachers" and this is possible through further

understanding and exploring the influences of varying contexts and the interactions between them on teacher knowledge (p. 241).

Others have also critiqued TPACK for its lack of clarity and a simplistic view over the concept of context. Abbitt (2011) explains that the concept of context and its potential influences are limited by the TPACK framework and recommends revisions and elaboration on the concept of context in TPACK.

Context is a very contested and complex concept and is conceptualised in various ways (Edwards & Miller, 2007). For instance, Dohn, Hansen, and Klausen (2018) explain that historically, the concept of context has been clarified by the domain, i.e., the boundary or geography that is assigned to context. Another approach to context is understanding it by the relation between the context and the learning action. Dohn et al. (2018) explain about two major approaches that is taken in the literature for clarifying the relationship between the concept of context and learning. On approach is referred to as a container metaphor and considers context as a surrounding (Beckett & Hager, 2002) that shapes learning action. The other approach is a rope metaphor approach in which an inter-relational connection between context and learning action is emphasised. In other words, the context is not a prior existence but it is developed in relation to learning actions. In this approach the learning processes forms part of, create and recreate context (Säljö, 2000). Säljö's (2000) description of the concept of context is based on socio-cultural theories of learning. Studies on teacher knowledge have treated the discussion of context as very important, often referring to sociocultural theories of learning as their analytical framework (Tsui, 2011).

Maintaining that context has been confined too narrowly to the teachers' workplace in TPACK, Porras-Hernández and Salinas-Amescua (2013) have also sought a more complex conception of context, through broadening what they refer to as the "scope" (p. 231). The scope supports

the conceptualisation of the effects of factors such as social, political, technological, and economic conditions on the development of teachers' knowledge at the different layers of classroom, school, and wider society (Porras-Hernández & Salinas-Amescua, 2013).

Another critique of TPACK is its limited number of constructing elements. The constructs of teacher knowledge in the literature have already been discussed earlier. Viewing this concern through what they refer to as "the actor", Porras-Hernández and Salinas-Amescua (2013) regard both students and teachers as the main actors in the educational processes. Hence, they proposed a revised version of the TPACK framework which adds in two other constructs, i.e., teachers' self-knowledge and knowledge of students to the model.

2.5.4. Teacher cognition versus TPACK

The literature reviewed has provided evidence that Mishra and Kohler's (2009) simple TPACK framework does not take account of the concept of culture, context, and the multiple dimensions of teacher knowledge. Using a sociocultural perspective, Borg (2015) suggests a more comprehensive account of language teacher cognition when he elaborates on the interplay between language teacher cognition and a teacher's prior schooling, professional training, and contextual factors on the classroom practice in his model.

Borg (2015) maintains that "the study of cognition and practice without an awareness of the context in which these occur will inevitably provide partial, if not flawed, characterizations of teachers and teaching" (p. 106). He further defines context as the "social, psychological and environmental realities of the school and classroom" that shape teachers' practices. Elaborating on the concept of context, Borg defines contextual factors as including a wide range of factors such as "parents, principals' requirements, the school, society, curriculum mandates, classroom

and school layout, school policies, colleagues, standardised tests and the availability of resources" (2003, p. 94).

Borg's (2015) language teachers' cognition model can be used to help address concerns raised by Adams (2016) and Belland (2009) on the influences of teachers' prior schooling. Although Borg does not directly refer to the influence of culture, this can be inferred through his emphasis on teachers' schooling experience and their personal history. However, Borg appears to limit culture to teachers' schooling and does not specifically discuss the influence of other cultures such as a teacher's own culture and the students' cultures on teacher cognition. Thus, Borg's view on language teacher cognition does not provide a framework through which the interplay between different contexts, cultures, and their influences on teacher cognition can be clearly explained.

The need for a framework through which these relationships could be better explained led to the consideration of an ecological framework. Although, an ecological framework can be critiqued for being overly complex with many different layers, but the complex nature of educational systems seems to justify adopting a complex theoretical framework. The ecological framework provided by the Arena of Change with digital technologies framework (Davis, 2018) appeared to provide a good basis for explaining ESOL teacher behaviour. This framework will be adopted for this research study and will be explained in more detail in the Section 3. 3. 3 in the section on the theoretical frameworks.

2.6. Teacher learning

As discussed so far, teacher cognition is subject to the influence of teacher learning and their inhabited cultures and contexts. The Organization of Economic Cooperation and Development (OECD) (2005) has categorised learning into three forms, i.e., formal, non-formal, and

informal learning. According to the OECD (2005, p. 5-6), "formal learning" can be achieved when a learner follows a programme of instruction in an educational institution or in the workplace. It is always recognised with a certificate or qualification. "Non-formal learning" is achieved when an individual follows an organised programme of learning in an educational institution or in the workplace, but it typically does not lead to certification. "Informal learning" results from daily work-related, family, or leisure activities. This form of learning is neither organised nor structured (OECD, 2005, p. 5-6). Similarly, in their book *Teacher Education in CALL* Hubbard and Levy (2006) identify two approaches to CALL learning contexts for teachers; one is formal pre-service and in-service CALL courses, projects, and workshops and the other includes expert-novice teacher mentoring, communities of practice, self-learning, and educational resources.

Richards (2008) differentiates between training and development based on their focus. Teacher training is "identified with entry-level teaching skills" offered to student teachers (Richards, 2008, p. 160). In teacher training courses, teachers' teaching skills often develop through observing the teaching of experienced teachers and/or practising teaching in controlled settings. Qualifications in teacher training such as CELTA (Certificate in English Language Teaching to Adults) are examples of this programme. The term "teacher development" is identified as "the longer term development of the individual teachers over time" (Richards, 2008, p. 160). Examples of teacher development courses are the qualifications offered by universities at the Masters or post-graduate levels, with the main focus being on applied linguistics. In such courses, practical language skills are often not prioritised (Richards, 2008).

Considering different learning contexts for the teachers, the following section will focus on the influences of teacher schooling and initial teacher education, as well as in-service professional

development programmes on ICT integration by teachers in general, and by language teachers in particular.

2.6.1. Teacher schooling and initial teacher education (ITE)

The idea that teachers tend to teach the way they were taught at school and during their ITE is a commonly believed notion (Adamy & Heinecke, 2005). In his study of a number of novice language teachers, Richards (1998) found that novice teachers' culture and background played a significant role on their practices.

Borg (2015) also recognises the influence of schooling, on the one hand, and professional coursework, on the other, on teachers' cognition and their decision-making process in the classroom. Also, Johnson (2013) acknowledges the influence of pre-service language teachers' "own instructional histories as learners" on their cognition (p.75). Accordingly, integrating ICT into teachers' ITE is important to support teachers in their ICT practices in their future teaching. The role of ICT in ITE in the teachers' ICT implementation has proven to be one of the success factors in teachers' ICT implementation and use in their professional life (UNESCO, 2007). Egbert and Thomas (2001) consider the lack of adequate integration of ICT in teacher training programmes as the greatest restriction to the integration of ICT in language instruction. The inclusion of ICT in ITE has undergone significant changes since then, and in the history of teacher education. According to Kesler and Hubard (2017), although there have been significant improvements in the field of ICT in ITE, there are still some shortcomings which need to be addressed.

Davis (2010) synthesises the literature on the most common strategies adopted for incorporation of ICT in ITE programmes into three areas: A. stand-alone ICT courses (in which training and learning is about ICT); B. infusion of ICT into methods and foundation courses (in which training is with ICT); and, C. application during field experience (in which theory is

put into practice) (p. 218). These strategies have been used either as an independent, single strategy, or in combination with one another. Elaborating on the differences between each approach, Davis explains that the standalone ICT courses are the most common approach in ITE programmes, but the ICT skills developed in this approach do not necessarily help the teachers to integrate ICT into their later classroom pedagogy. The second strategy enhances pre-service teachers' computer self-efficacy beliefs to a more practical level, through integrating a range of collaborative, authentic, and meaningful tasks to be accomplished using ICT tools. The third strategy is presented as the optimum strategy for the ICT integration in ITE, in which the pre-service teachers not only put their ICT-based lessons into practice, but also enhance the knowledge of the teacher who is the associate or mentor for the ITE student teacher. However, according to Davis (2010), this is a very challenging process, which may not be convenient to achieve, due to various contextual factors such as the mentor teachers' attitude towards ICT and school infrastructure. It is worth noting that since the publication of Davis's (2010) entry in the latest edition of *International Encyclopaedia of Education*, there have been further developments in ITE due to the evolution of ICT and the emergence of mobile technologies, which afford new strategies for learning and teaching. Furthermore, the frequency of some practices may have changed since 2010 and attention may have shifted from the more stand-alone ICT courses to more integrated ones.

Despite the growing importance of ICT in the field of language teaching and the demand for ICT proficient language teachers, the integration of ICT and CALL courses in second language ITE programs is lagging behind (Hubbard, 2008; Kessler, 2006). The integration of ICT into language teaching or, more specifically, Computer Assisted Language Learning (CALL) teacher education is so specialised that Torsani (2016) refers to it as a separate but dependent field in language teaching. Initial teacher education is considered a strategic area for CALL to

be successful (Egbert & Thomas, 2001; Kessler, 2008; Torsani, 2016). Based on the literature, Hubbard (2008) suggests various approaches to ICT instruction in language teacher education, namely, breadth first, depth first, and integrated. He describes a breadth-first course as an introductory course that provides general information on wide topics on the use of ICT in language teaching. He further argues that "ideally" such course should "build both technical and pedagogical skills and knowledge" (Hubbard, 2008, p.181). In a depth-first approach, on the other hand, "all or part of the CALL course may focus heavily on a single area, allowing students a narrower but much more intensive experience, especially if the objective is a project", allowing for hands-on task experience (Hubbard, 2008, p.181). Unlike the first two approaches where ICT is presented in a stand-alone CALL course, in the integrated approach, ICT is integrated in multiple places during the student teachers' courses (Hubbard, 2008). An online approach was another approach in which learning about ICT happens through using ICT. In this approach ICT becomes a platform through which communication, collaboration, and learning transpire.

However, research suggests that ICT integration in second language teacher education (SLTE) has not gained much success and the majority of the graduates of such programs remain unsatisfied with the little amount of ICT training offered (Kessler, 2007). Egbert, Paulus, and Nakamichi (2002) have also shown concerns over the student teachers' lack of use of ICT in their teaching practices following their ITE coursework. Tarone and Allwright (2005) believe that "differences between the academic course content in language teacher preparation programs and the real conditions that novice language teachers are faced with in the language classroom appear to set up a gap that cannot be bridged by beginning teacher learners" (p. 12).

Shortcomings such as "inadequate breadth", "general lack of preparation", 'lack of contextualisation", "lack of use following training" and "reliance on informal preparation" are

major highlights of the research in this area (Kessler & Hubbard, 2017). Hubbard (2008) outlines seven reasons that impede a successful integration of ICT and CALL into initial teacher education courses, i.e., inertia, ignorance, insufficient time, insufficient infrastructure, insufficient standards, lack of an established methodology, and lack of experienced knowledgeable educators.

Since 2008, there has been considerable improvement in some aspects. The International Society of Technology in Education (ISTE) has developed various sets of standards or benchmarks for students, teachers, education leaders, coaches, and computer science educators to amplify and transform teaching and learning in K-12 schools in the digital age (ISTE, 2008, 2019). Such standards provide accountability to the field by suggesting a "clear statement of instructional outcomes in educational guidelines for the program development and curriculum development" (Richards, 2008, 172).

Specific to the field of second language learning is TESOL Technology Standards (TTS) (Healey, Hanson-Smith, Hubbard, Ioannou-Georgiou, Kessler & Ware, 2011). TTS offers a framework for teachers, learners, teacher educators, and administrators to realise what technological and pedagogical knowledge is expected of them when using ICT (Healey et al., 2011). The TTS framework consists of four central goals with fourteen standards for teachers and three central goals with eleven standards for learners. However, critics of the standards argue that

> the standards themselves are largely based on intuition and are not research based, and also that the standards movement has been brought into education from the fields of business and organizational management and reflects a reductionist approach in which learning is reduced to the mastery of discrete skills that can easily be taught and assessed. (Richards, 2008, p. 172).

Furthermore, by their nature, standards are very prescriptive and are mainly used for evaluation purposes in the literature. Tschichold (2016) for instance, mainly used the TTS as a tool for evaluating to what extent a CALL module can prepare students with the knowledge and skills required for integrating ICT tools in their teaching. Arnold (2013) also used TTS as an evaluative tool to assess the degree to which a number of methodology textbooks cover CALL elements in their content. Moreover, these standards are very broad and techno-centric and, as such, they cannot foreground the pedagogical purposes for which the tools are used. They do not particularly cover the roles and functions of ICT and how ICT can be used to accommodate second language learning pedagogical principles. Arnold (2013) explains that TTS should include elements such as the teachers' affective development, their self-efficacy beliefs, and their beliefs in their goals. He further argues that implementing TTS is not possible through a single formal course or textbook. This indicates further planning through other sources to compensate for the limitations of applying TTS in ITE.

Since the context of this study is New Zealand secondary ESOL, it is important to review how IT has been implemented in ITE in this context. ITE in New Zealand has gone through various changes in different periods and the evolution of ICT in learning and teaching contexts made ITE even more challenging and complex (Alcorn, 2013). Unfortunately, except for a few studies that focus particularly on the implementation of some ICT tools or certain strategies (such as Tolosa, 2017 on the role of mobile technologies in ITE), no overview or review of current practices with ICT in ITE in New Zealand at the national level could be found (Davis, 2012). Writing about New Zealand in particular, Brown and Chamberlain (2009) explain that this may be partially because ITE providers have their own approaches to teaching and learning strategies and their courses are not nationalised.

In addition to what has been discussed so far, it should be noted that not all language teachers have had CALL courses during their ITE programmes (Kessler, 2006), and those who have, may not have necessarily benefited from them and may have sought substitutes in other learning sources. For instance, Kessler (2007) argues that the graduates of SLTE courses obtain the majority of their CALL knowledge from informal sources. This means that the level of ICT integration in ITE programmes and its effectiveness alone cannot influence teachers' ICT practices and other sources should also be sought. Furthermore, the constant evolution of ICT and the diversity of different teaching contexts make the integration of ICT knowledge gained from ITE programmes a more complex phenomenon. This makes the presence of in-service teacher education with more situated contextual learning for practising teachers more crucial (Hubbard, 2008).

The following offers a review of the literature relevant to in-service teacher professional learning and development programmes and their influence on practising language teachers' ICT integration.

2.6.2. In-service professional learning and development (PLD)

Relevant and continuous in-service professional learning development programme is perceived as one of the most effective ways of updating schools and supporting teachers with innovative pedagogies, particularly when it involves ICT integration (Benade, 2017). As with initial teacher education, teacher professional development processes have also gone through various reforms and have been offered in various forms of formal, non-formal, and informal learning opportunities. Law (2010) expounds some of the early initiatives taken in various countries in the development of in-service teacher professional development. These initiatives range from emphasis purely on the development of teachers' technical skills to integrating pedagogical aspects into programmes. Inspired by the UNESCO (2002) framework for ICT in teacher

education, Law (2010) particularly emphasises the close connection between the school ICT maturity level (emerging, applying, infusing, or transforming) with teachers' ICT-related competencies (technical, pedagogical, social, collaboration, and networking).

The first two stages of school ICT maturity are described as the stages in which students are learning ICT skills through ICT courses (emerging) and are then provided with opportunities to apply their ICT knowledge to specified learning contexts (applying). The responsibility of guiding the students at the first two stages is limited mainly to those teachers who conduct ICT curriculum courses or those with sufficient ICT skills and confidence (technical). It is at the next stages where all the teachers become engaged in integrating ICT into their curriculum area and taking new approaches for students' learning. Developing teachers' "technical and pedagogical ICT skills in the relevant subject areas as well as collaborative, cross-curricular uses of ICT" are the main focus of teacher professional development programmes to support the teachers develop their ICT competencies for the schools that are growing into the infusing stage (Law, 2010, p. 213). Law (2010) views the transforming stage as the most advanced stage of school development through which students' learning is transformed by the use of ICT to provide "differentiated and individualised learning opportunities" (p. 213). This level of schools' ICT maturity entails the teachers' mastery over all the competencies mentioned earlier, as they need to be independent lifelong learners and agents of change in the schools and professional learning communities (Law, 2010, p. 213). However, as Law claims, not all approaches to teacher professional development are successful in improving school maturity, enhancing the teachers' ICT competencies, and balancing the connections between the two. Referring to the characteristics of successful PLD, Davis (2018) compares the cases of an unsuccessful with a successful model of teacher professional development, which took place from 1999 to 2001 as part of a national ICT professional development initiative for K-12

schools in the United Kingdom. The former was a case of an extensive computer-based programme conducted fully online, with the support of some curriculum-based and computer skills software, and the latter was a face-to-face programme blended with e-resources and e-portfolios. Using an ecological perspective within the Arena framework (see Section 3.3.3), Davis (2018) challenges the former case, due to its techno-centric, top-down approach, and the one-way flow of mass-produced resources from IT companies to the teachers in the school with "little direct link to each teacher's classroom and their schools" (p. 86). The unsuccessful nature of such types of techno-centric approaches have also been addressed by Harris, Mishra, and Koehler (2009). In search of an explanation for the simple, unsophisticated, and limited use of ICT in K-12 schools in the United States, Harris et al. (2009) analysed teacher education approaches to ICT integration and concluded that the techno-centric approaches often ignore the interdependent and complex relationship between technology, pedagogy, content, and context. They further claimed that such approaches often neglect the "variation inherent in different forms of disciplinary knowledge and inquiry, as well as the varied strategies that are most appropriate in teaching" (p. 395). As such, they suggested designing TPACK-based, discipline-specific types of activities for teachers' PLD purposes as opposed to generic techno-centric ones; a type of activity that is sufficiently flexible and inclusive to accommodate as many diverse teaching methods and philosophies within each discipline area. The purpose was to support the teachers to select appropriate activities that suited their needs and those of their students. However, in their suggested solution, Harris et al. (2009) did not offer any explanation or evidence of the success rate of such approach, nor its affordability and sustainability. Furthermore, there was little elaboration on how, and by who, these activities should be designed, and the level of teachers' and schools' involvement in the development and preparation of such TPACK-based activities. To address these issues, what Davis (2010) describes as a more effective organic approach can be applied. Davis (2018) explains that,

unlike techno-centric models, an organic model offers a sustainable approach. Because the Arena framework is based on co-evolution, it naturally continues to update the needs of teachers' schools and organisations, the requirements of discipline areas, and the related pedagogies, and local and national professional development policies (Davis, 2018).

Similar to this organic model, Rickard, Blin, and Appel (2006) reported on the success of a two- phase CALL in-service professional development model initiated for in-service language teachers in the Republic of Ireland, namely OILTE (Organizing In-Service Training for Language and Technology in Education). The first phase of the model aimed at training the trainers. It involved preparing and educating a group of 18 practising, experienced language teachers with ICT skills through intensive courses. In the second phase, the trainees became trainers and held in-service courses and follow-ups for other teachers in their province. It is important that some practical factors including "professional release time for trainers who are themselves classroom language teachers, appropriate compensation for the extensive preparation time, adequate hardware and software support, and formal academic recognition of trainers' expertise" (Rickard et al., p. 202) be considered for better results.

Researchers does not always report on the successful implementation of the knowledge and skills gained through such courses in the teachers' classrooms. Son's (2014) survey study of 77 teachers who took a CALL course in Australia suggests that despite their training, some of the teachers did not integrate CALL in their pedagogy. Lack of confidence and time were amongst the most frequently reported barriers. Wong and Benson's (2006) study of the differences between teachers' ICT practices after the in-service CALL training courses signifies the importance of the influence of teachers' individual characteristics, such as their pedagogical approach on their ICT practices in the long term, although they might appear to be similar in many levels such as ICT skills and age. These results, as suggested by Hubbard

(2018), call attention to the complexity of conducting professional development in a dynamic area such as CALL. Warning against such obstacles as inertia, ignorance, insufficient time, and infrastructure and, in order to avoid a sense of disappointment and frustration in the teachers, Hubbard (2018) recommends that providers realistically take into account "the individual teacher's background and attitudes with respect to educational technology, the students he or she is teaching, and the physical and administrative environment where the language instruction is taking place" (p. 3) when planning for a professional development course in CALL.

Professional development can be accomplished in formal and informal ways, from formal classes and workshops to collaborative or individual self-directed learning (Hubbard, 2008). Websites, professional journals, communities of practice, special interest groups (SIGs), Electronic Village online (EVO), and MOOCs are some of the resources available to teachers for their professional development in CALL (Hubbard, 2008). Teachers' interactions with learning communities and colleagues have been perceived to be one of the most common ways through which English language teachers can develop and enhance their knowledge of CALL outside the formal forms of learning (Egbert, Paulus, & Nakamichi, 2002). Ertmer et al. (2012) also believe that professional learning networks, such as professional development websites, twitter, and blogs can inspire teachers in adopting and experiencing technology.

The approaches to teacher professional development discussed so far were mainly based in the United States and the United Kingdom contexts. Considering each country's unique context, and given that New Zealand is the context for this study, it is important to understand the ICTPD initiatives and practices that have taken place in this country. Although it may be an international concern, Brown and Chamberlain (2009) point out that attending to ICTPD practices in this context becomes even more important as "the teaching profession in New

Zealand […] is a rapidly aging one with limited experience of ICT" during their initial teacher education (Brown & Chamberlain, 2009, p. 423). Hence, professional development in ICT appears to be playing a crucial role in teachers' professional development, particularly for the older teachers with limited exposure to ICT at the time of their ITE. The study of the literature on ICT professional development in New Zealand documents some initiatives in this area. These initiatives have included the lunching of Te Kete Ipurangu (TKI), the online education portal site for both primary and secondary sectors and teachers that includes virtual learning networks (VLN) supported by the Ministry of Education in order to support the needs of schools and the individual teachers with easy online access to curriculum, professional development, and administration-related resources as well as connections with colleagues. The funding of 23 exemplary schools in ICT practices to conduct ICTPD programmes in their region in the form of school clusters (Brown & Chamberlain, 2009). Some of the ICT initiatives in New Zealand schools include the "Digital Horizon: Learning Through ICT" and "Enabling the 21st Century Learner: An e-Learning Action Plan for Schools" (Ministry of Education, 2006). However, the report did not identify how ESOL teachers developed their knowledge and skills of ICT and how much they benefitted from the resources available to teachers.

2.7. Teaching context

The influence of the teachers' teaching context on their practices is a recognised phenomenon (Borg, 2015; Richards, 2008). This includes who they teach, the subject matter they teach, and the environment in which they teach. These are explained below.

2.7.1. Learner culture

The learners play a significant role in teachers' classroom practices. Critiquing the conceptual framework of the knowledge base of L2 teacher education put forward by Freeman and Johnsons (1998) as well as Richards (1996), Tarone and Allwright (2005) point out that those conceptual frameworks lack focus on the learner, the knowledge of second language acquisition (SLA), and how learners learn. They suggested the need for further elaboration on SLA as well as "a clear understanding of learners, who they are, why they learn, what they need to learn, what motivates them, and how a teacher goes about negotiating the teaching and learning activities with them" (p.18).

Adam (2016) reports on the importance of the influence of cultures on teacher practices and students' acceptance. She explains that the students' rote learning culture stemming from other socio-cultural norms can influence teachers' pedagogy and their use of ICT. This was illustrated when one of her participant teachers decided to change her pedagogy from a technology-enhanced and interactive approach to a teacher-directed approach because she felt that her students expected a teacher-directed classroom instruction from their teacher in her context.

Attention to learner characteristics and their needs appear to be of great importance for teaching second language learners who have migrated into a different culture and context. Using a narrative enquiry research method, Miller and Endo (2004) depict specific problems faced by a number of ELLs in the United States context, such as their struggle with English language, culture, pedagogy, and a U. S. curriculum. They argue that ELLs entering a new learning environment experience a high degree of anxiety due to their limited language skills and their unfamiliarity with culture, curriculum, and pedagogy in the school. Lack of attention to these students' needs may also exacerbate feelings of anxiety and stress. Miller and Endo (2004)

further argue that such conditions, if not immediately and effectively addressed, would reduce ELLs' language learning abilities and result in low motivation and low self-esteem. This may indirectly influence teachers' inclination to adopt ICT, since students' motivation and engagement is a powerful driving force for teachers' level of ICT integration (Ertmer et al., 2012).

Similar concerns have also been raised about the pedagogical approaches the ELLs are familiar with due to their schooling experience in another country. Studies on international Asian students in New Zealand report that these students often come from mostly teacher-directed learning cultures in which the role of the teacher is more authoritative and students are more passive receivers of knowledge (Campbell & Li, 2008). Campbell and Li (2008) argue that having to adjust to the teaching methods practised in another country's schools is a stressful process, which, if not addressed properly, not only requires much effort from international students, but also makes them feel isolated and less motivated to develop a sense of belonging to their learning environment. Such conditions become worse when the students are left to find out on their own how things work. Other studies on similar topics conducted by Wohlfarth et al. (2008) also reveal that transitioning from a conventional teacher-centred teaching approach to a student-centred approach can be intimidating and unsettling for many students and challenging for those teachers.

It has also been claimed that students' insufficient language skills, their lack of experience in the critical use of digital resources, and insufficient IT skills, stemming from limited exposure to the instructional uses of ICT, can become a source of frustration for both students and teachers in the process of ICT integration (Gustafson, 2004; Lam, 2000; Sardegna & Yu, 2015; Son, Robb, & Charismiadji, 2011). A study of 301 Japanese learners of English conducted by MacLean and Elwood (2009) indicates that students generally exhibited low proficiency with

ICT tools used for instructional purposes. Similar results were reported by Jung (2006) of 591 Chinese students who are learning English as a foreign language in China. According to this research, these learners spent very limited time using ICT for educational purposes. One of the major reasons for their lack of inclination towards using ICT for English language learning was their limited technical skills. Interestingly, only 12 percent of the students in Jung's study perceived themselves as proficient ICT users. In such situations, another challenge for teachers has been in managing the classroom and attending to students' misbehaviour on their devices (Lim & Khine, 2006; Wachira & Keengwe, 2011).

Dijk and Hajer (2018) also express concerns over the relationship between students' ICT skills and language proficiency. They argue that in order to learn about ICT, one should be proficient and understand the language that is used to teach ICT and the special vocabulary associated with it. Khani and Kamangar's (2015) quantitative study on a group of EFL students in Iran highlights a direct relationship between the EFL students' language proficiency and their computer literacy. The results revealed that familiarity with technical vocabulary and the knowledge of English language impacted on EFL students' level of ICT use. The lower the students' ICT skills are, the less the teacher may be motivated to use it (Ertmer et al., 2012).

Students' ICT skills are often directly related to their socio-economic level and whether or not they have personal access to a computer at home. Liu, Theodore, and Lavelle (2004) report that the students' socio-economic situation and the area in which the school is located influence teachers' adoption of ICT. The impact of the digital divide and student access issues are similarly emphasised by Wickersham and McElhany (2010). However, the concept of the digital divide no longer merely refers to access to ICT and its ownership, but, as digital technologies become more accessible and affordable to students, it has been extended to encompass factors such as the manner in which ICT is used as well as students' digital

proficiency, which has come to be referred to as the "second-level digital divide" (Hargittai, 2001, p.1). The second-level digital divide is influenced by factors such as users' demographics, social support, experience, and exposure to the medium as well as their autonomy (Hargittai, 2001). Results from a large scale quantitative survey study on ELLs' socio-emotional needs in New Zealand over a decade underscores the fact that these students are often socially isolated and have difficulty connecting and forming friendship with local students (Butcher & McGrath, 2004; McGrath & Butcher, 2004; Park, 2015). Bethel's (2015) study on 1527 international students in New Zealand indicates that both individual and contextual factors, that is, factors such as age, English language proficiency, and perceived cultural inclusion, contributed to the ELLs' ability to connect with domestic students. Bethel further suggests that in order to support international students in this matter, educational institutions need to provide more culturally inclusive environments and more substantial language support. These studies highlight the need to attend to general emotional, social, and language needs of ELLs in a wide range of contexts.

Anderson's study (2014) of 1745 Midwest high school students in the United States revealed that the students' ethnicity and socio-economic status had a significant impact on their access to and use of ICT tools inside and outside school. Similarly, Jackson et al. (2008) and Warschauer (2007) argue that race and gender have a direct correlation with the nature and degree of students' ICT use and, consequently, their academic performance. For instance, students from specific ethnic backgrounds and lower socio-economic backgrounds are "more likely to use computers for drill and practice, whereas students who are white or high-income are more likely to use computers for simulations or authentic applications" (Warschauer, 2007, p. 148).

Although the integration of ICT may face a number of barriers, the integration can also help with alleviating some of the hardships that students may encounter. Tipton, Bennett, and Bennett (1997) argue that ICT could be used to overcome the challenges of diversity amongst students: "Technology provides educators with tools to address equity and access issues, to accelerate students' linguistic and conceptual development, to provide support for students who learn in different ways, and to create authentic and meaningful learning experiences" (p. 29). However, it should be added that most of the research on the effectiveness of ICT integration on ELLs' academic achievements has been conducted in mainstream learning areas such as mathematics (B. Freeman, 2012; S. Kim, 2018; López, 2010), and further study is needed on the effectiveness of ICT on such students' language development.

2.7.2. School culture

School culture has been simply "encapsulated in the phrase 'the way we do things around here'" (Davis, Mackey, & Dabner, 2018, p. 134). The relationship between teacher practice and school culture, including the attitude of school management and leadership towards change, school status, collegial interaction, technical support, and access to ICT and resources has been frequently referred to in the literature (Adamy & Heinecke, 2005; Ertmer et al., 2012; Fullan, 2007; Veen, 1993). Tondeur, Devos, Houtte, Braak, and Valcke (2009) discuss the influence of school characteristics on ICT integration under two main themes: "cultural school characteristic" and "structural school characteristics" (p.223). The former includes factors such as school leadership, and the latter encompass factors such as school infrastructure, and support. They administered three scales namely: "Class use of computer scale", "ICT planning" and "ICT support" to 527 primary school teachers in a region in Belgium. The findings suggest that cultural and structural school characteristics are closely related and together they influence teachers' ICT practices. Furthermore, in their review of the literature on factors that contribute

to teachers' use of ICT, both Mumtaz (2000) and Fu (2013) draw on the strong impact of specific school characteristics. These include attention to institutions' inadequate allocation of time and support for teachers to become familiar with ICT and take risks, the rigid timetable and strict curricula, lack of sufficient networking and collegial support, technical facilities, and technician support for teachers, especially the less confident ones.

Adamy and Heinecke (2005) describe the integration of ICT into the schools as a "social process that must have administrative support to succeed" (p. 223). The role of school management and leadership in leading the change is so important that Fullan (2007) claims "I know of no improving school that doesn't have a principal who is good at leading improvements" (p.160). According to Owston (2007) ICT integration in the school is no different from any other change. Ertmer et al.'s (2012) study on 12 K-12 school teachers who were exemplary in their ICT practices in their schools recognises the impact of school and administrative support as being equally influential as other factors discussed earlier in this chapter in teachers' integration of ICT in the school.

The school management and leadership have a profound role in facilitating opportunities for teacher interaction and professional engagement. Facilitating such opportunities is important. Based on the findings from a large scale survey study in the United States, Becker and Riel, (2000) argued that teachers' professional development and engagement is strongly influenced by the frequency with which teachers enjoy collegial interaction and exchange of ideas and the frequency with which they attend and contribute to conferences and workshops. Similar findings have been reported by Borg (2015). In his review of the literature on the extent to which first year language teachers apply the knowledge they have obtained during their ITE into their classroom practices, Borg (2015) also identified collegial relationships and school

context, along with other factors such as the teachers' workload as influential in the transfer of their knowledge from theory to practice.

The schools' level of infrastructure and access to ICT was another factor highlighted in the literature to be contributing to teachers' ICT integration and use (Ertmer, 1999; Fu, 2013). This is also a similar concern in New Zealand context. According to a 2014 report on digital technologies in New Zealand schools, 95 percent of school principals reported the costs of digital technologies as the biggest barrier to their use in their schools. Douglas, (2011) identifies different levels of access to ICT depending on the purpose of use in New Zealand schools. He suggested three "distinct but overlapping" purposes for the use of ICT in the schools, i.e., for administration work, for teachers' teaching and for students' learning (p. 126). He further explaines that providing ICT for teaching and administration purposes is usually managed by the school. The Laptop for Teachers scheme (Ministry of Education, 2003) was an effort to support the schools and the teachers in New Zealand for this purpose. However, the use of these laptops was reported to be mainly for administration purposes and communication with colleagues and parents and classroom material development rather than for teaching and learning purposes in the classroom (Cowie, Jones, & Harlow, 2006). As Cowie et al., (2011) suggest, organisational support, school leadership, and professional development opportunities play a pivotal role in supporting teachers in the use of their laptops. Douglas (2011) refers to improving students' learning as another motif for ICT integration. Developments in ICT, the availability of more personal and mobile devices, and implementations of schemes such as Bring Your Own Device (BYOD) approach, which could engage both schools and families in providing infrastructure and support, can provide new opportunities for the use of ICT for students' learning (Douglas, 2011).

As the responsibility of providing ICT is shared between the schools and the students' families, there arise concerns regarding the socio-economic conditions of the families and the schools. Becker (2000) claims that socio-demographic and socio-economic properties of the school play a role in teachers' use of ICT for students' learning. Douglas (2011) also cautions against BYOD approach, explaining about possible incompatibility issues between school ICT tools and that of the students. He further warns that "should a teacher embark on this approach they will spend the entire lesson performing ICT problem-solving tasks". However, Douglas does not provide any empirical evidence for his claims.

In addition to ICT access, the kind of technical support provided for teachers in the school influences teachers' use of ICT (Adamy & Heinecke, 2005; Bullock, 2004; Howland & Wedman, 2004). According to Norris, Sullivan, Poirot, and Soloway (2003), "teachers' use of technology for curricular purposes is almost exclusively a function of their access to that technology" (p. 25). Smerdon et al. (2000) maintain that teachers needed to be confident that in case of any problem, technical support would be available to them. The research indicates that the more access teachers have to appropriate software and IT technicians, the higher the chances of their ICT integration into their curricula and lesson plans. Zhao and Frank (2003) suggest that teachers' interaction with their colleagues could also increase the likelihood of ICT use. They explained further that through collegial interaction and positive rapport between the teachers, they can both develop their knowledge of ICT and receive situated technical support. The kind of support and learning that teachers received from their interactions with peers and colleagues in the school could be considered an informal form of learning and support.

So far, this section reviewed the importance of school characteristics, i.e., those structural and cultural influences on the teachers' ICT integration. However, there is no study on how school

characteristics might influence ESOL teachers' ICT integration in particular. This study hopes to address this gap by illustrating how ICT is used by ESOL teachers and how school culture and students' access to ICT can influences ESOL teachers' practices.

2.8. Conclusion and the way forward

Drawing upon the literature, this chapter identified several aspects that will be valuable to inform the design and analysis of this research. The review of the literature in this chapter started with an overview of the roles of ICT in educational settings in general and in language teaching in particular. This revealed that there appears to be little empirical evidence on the pedagogical functions of ICT with particular focus on second language learning principles in second language classrooms. The review continued with presenting and elaborating on a number of factors that influence the integration of ICT in diverse educational settings. Different classifications have been introduced to elaborate on the factors that influence teachers' ICT practices in educational settings. However, many of these classifications appear to be problematic since the factors are highly interdependent and there is a considerable overlap between them. Furthermore, recognising the role of teacher cognition in the process of change, the literature foregrounds a complex range of cultures that may interact with and influence language teachers' cognition including teacher schooling, pre-service and in-service teacher education, and their teaching contexts. Although the literature briefly refers to the inter-related, complex relationship between these factors, but it was rarely to find a discussion of how these factors relate and influence one another particularly in complex language learning contexts. This leads to the conclusion that a complex theoretical framework may be required to interpret teachers' behaviour in their ICT integration process (Davis, 2018; Zhao & Frank, 2003). The next chapter presents the methodological approach taken for this study and introduces the analytical tools and theoretical frameworks used to address some of the gaps discussed.

Chapter Three
Methodology

3.1. Introduction

This chapter outlines the research paradigm, i.e., the philosophical and theoretical bases of the study. It presents the researcher's ontological, epistemological, and methodological stance. It then presents the method through describing the participants, their selection process, the data collection techniques, and the data analysis stages. It also discusses the researcher's positionality and the research quality and ethical considerations.

3.2. Research paradigm and approach

Paradigms or philosophical assumptions refer to the theoretical structure within which a specific body of knowledge can be studied and interpreted in a particular way (Mackenzie & Knipe, 2006). A research paradigm clarifies the researcher's actions in his or her decision-making process (Creswell, 2013) and the basic beliefs and worldviews of the researcher (Guba & Lincoln, 1994). Ontology, epistemology, and methodology are the main philosophical assumptions that guide a research paradigm (Guba & Lincoln, 1994; Mertens, 1998). Succinctly defined, ontology questions the nature of reality and how it is viewed; epistemology addresses the nature of knowledge, how it is constructed, and how reality is acknowledged and justified; methodology involves the selection of a research approach and method highlights the data collection and analysis processes undertaken in research study (Creswell, 2013; Guba & Lincoln, 1994).

Lincoln, Lynham, and Guba (2018) suggest five major inquiry paradigms, i.e., positivism, post-positivism, critical theory, constructivism, and participative. Researchers may select any of the paradigms based on their ontological, epistemological, and methodological stances. I have adopted constructivist perspective in this study. Constructivism emphasises the role of

interactions with the social world in constructing meaning and in generating perceptions of self and others (Merriam, 2009; Neuman, 2006).

With regards to ontology, unlike positivism (which posits the existence of a single, apprehendable, discoverable, time-free, and context-free reality) in constructivism, reality is intangible, plural, relative, socially constructed, continuously evolving, and cannot be easily extended to other contexts and times (Crotty, 1998; Guba & Lincoln, 1994; Mertens, 1998). Researchers who claim constructivist stance recognise multiple realities and varied interpretations that are constructed through the subjective meanings that people develop from their experiences and social interactions within specific contexts (Creswell, 2013; Denzin & Lincoln, 2011; Neuman, 2006). In this study, I neither adhere to a single reality nor seek to generalise the findings. Rather, I tried to investigate how various factors shaped the participating ESOL teachers' ICT practices and the ways in which they constructed reality. Hence, multiple realities are expected, since the teachers and the meaning they make out of their lived experiences and the cultures vary with their situations.

Epistemologically speaking, unlike positivism, where the findings are objective measures through scientific inquiries and the researcher and the researched are considered as detached and independent entities, in constructivism knowledge is subjective and transactional (Guba & Lincoln, 1994). In other words, there is a close connection and interaction between the researcher and the researched object, and the values of the researcher influences the findings. This is inevitable, especially since in qualitative research, "the researcher is the primary instrument for data collection and data analysis" (Merriam & Grenier, 2019). This study does not seek an objective approach to the construction of knowledge about the phenomenon; instead it advocates for a subjective and transactional knowledge that is co-constructed by the interaction between the researcher and the ESOL teachers' reported behaviours and

interpretations of their lived experiences. Expert participants and selected documents also aided this co-construction.

With the semi-structured interview being the primary instrument in the data collection process, I attempted to ask questions that prompted the ESOL teachers in this study to reflect on and talk about their personal experiences in relation to their ICT practices in New Zealand secondary school context. Hence, where necessary, the interview questions were altered and modified to better probe the "reality as it is subjectively experienced by individuals" (Gall, Gall, & Borg, 2005, p. 325). Furthermore, the underpinning constructivist beliefs in this study enabled me to interpret and make sense of the world in which the participants lived and to create meaning out of their experiences about their teaching and their interactions with the environment that they inhabited.

The methodology in constructivism is qualitative and interpretive (Guba & Lincoln, 1994). A qualitative methodology enables the researchers to acquire a thorough understanding of the people engaged in the phenomenon, to explore how people grasp the phenomenon, and to develop meaning out of their experiences under the influence of their social, cultural, and personal contexts (Bryman, 1988). Scholars have offered varying approaches to qualitative research referring to them as "orientation" (Patton, 2015), "traditions" (Cresswell, 2007), and "strategies of inquiry" (Guba & Lincoln, 1994). For instance, Cresswell (2007) identifies five approaches, i.e., narrative, phenomenological, grounded, ethnography and case study to qualitative research. The approached differ from one another based on the focus of research, type of research questions asked, the data collection techniques used, the data analysis method applied, and the presentation format (Merriam & Grenier, 2019).

However, a considerable number of research studies, in general, and educational research studies, in particular, do not fall under any of the well-established qualitative research

approaches (Liu, 2016; Merriam & Grenier, 2019; Kahlke, 2014). Sandelowski (2000) has warned against "a confusing state of affairs … whereby studies are called narrative, even though they may include nothing more than minimally structured, open-ended interviews; phenomenologic, even though they may include nothing more than reports of the 'subjective' experiences of participants" (p. 334). This stance, not only implies that researchers need to be more specific, detailed, and careful in claims that they make about their approach, it also suggests a need for a methodological approach that does not precisely fit into any of the well stablished approaches.

Consequently, Merriam and Grenier (2019) recognise the generic qualitative approach as one type of approach to qualitative research and labelled it "interpretive" approach. The interpretive or generic qualitative research has the characteristics of a qualitative research, i.e., it aims at understanding "the meaning people have constructed about their world and their experiences" (Merriam & Grenier, 2019, p.5). However, this approach "refuse[s] to claim allegiance to a single established methodology", thus allowing the researcher to "borrow from" or "draw on" established methodologies, "but deviate[s] from its intent, rules, or guidelines" (Kahlke, 2014, p. 37). A generic qualitative approach is epistemologically constructivist, theoretically descriptive and interpretive, and it aims at understanding and discovering the phenomenon, the participants' worldviews, their perspectives, and the processes (Merriam & Grenier, 2019).

This qualitative research approach is selected since the focus of this study did not fit neatly within the boundaries of a single established methodology. The study aims to explore the reported influences on New Zealand secondary ESOL teachers' ICT practices through the participating ESOL teachers' perceived interpretations of their experiences and situations. This was a complex phenomenon and the complexity made the selection of the research design for this study a difficult process. The complexity of the influences on individual teachers' ICT

practices may be explored through the voices represented in the teachers' stories of their lives about a phenomenon (Creswell, 2013; Merriam & Grenier, 2019). In this study individual teachers' narratives of their contexts are explored, which made the selection of a narrative approach a possible option. Furthermore, given that the female teachers appeared to form the majority of New Zealand ESOL teachers' population (Haddock, 1998), and they were teaching students who were considered minority learners, questions of power and "how the social and political aspects of the context may shape how people see or understand the situation" could also become a focus of study (Merriam & Grenier, 2019, p.4).

Therefore the research topic is multi-faceted and different aspects of the influences on ESOL teachers' ICT practices entail the use of several methodologies, rather than adopting any single well-established qualitative research approach. Furthermore, due to different ontological and epistemological stances, combining these different methodologies may not simply be possible within the framework of the established methodologies. Hence, a generic qualitative approach due to its flexibility and the fact that it is "not guided by an explicit or established set of philosophical assumptions in the form of one of the known qualitative methodologies" (Caelli, Ray, & Mill, 2003, p.2), appeared to be an appropriate fit for this situation. This approach allows the researcher to walk a tricky but creative line between borrowing the prescriptiveness of established methodologies and using the flexibility offered to create new meanings (Kahlke, 2014; Thorne, Kirkham, & O'Flynn-Magee, 2004). In other words, despite the number of perspectives of how the influences on the ESOL teachers' ICT practices, this approach could be used to fit the research design.

In order to design my generic qualitative research, I borrowed elements from interpretive phenomenology. Interpretive phenomenology adopts a constructivist worldview and looks deeply at people's personal perceptions and how they develop the meaning of the personal and

social experiences they have in their interactions with the world (Smith & Osborn, 2008). In other words, the role of the researcher as the interpreter of the situation, along with the description of the phenomenon, is highlighted (Moustakas, 1994; Seale, 2011; Smith & Osborn, 2008). This is useful because the findings are based on the participants' reported perspectives of their lived experiences, as well as my interpretations as the researcher. First, with no intention of judging the quality or evaluating the ESOL teachers' ICT practices, I sought their experiences and their interpretation of their ICT practices, including their ICT adoption, adaption, and integration process. Then I added in my interpretations of the phenomenon during data analysis and discussion stages.

This study also benefitted from elements of biographical narrative study. In biographical narrative study, "the researcher writes and records the experiences of another person's life" in a form of a story emerged from the data (Cresswell, 2007, p. 53). Stories are crucial to the design of the narrative study as they "organize and shape our experiences and also tell others about our lives, relationships, journeys, decisions, successes, and failures" (Patton, 2015, p. 128). Narrative stories are normally theory-driven, i.e., they are developed and interpreted through the application of a theoretical lens that suits the aim of the study (Cresswell, 2007). Part of the data in this study is presented in the form of three short stories called vignettes. These stories emerged from the lived and told experiences of three ESOL teachers narrated to the researcher aiming to unfold these individuals' experiences. In addition, the ecological perspective presented within the Arena of Change with digital technologies framework (Davis, 2018) was applied to guide the analysis and shape the meaning of the stories.

It is worth mentioning that the flexible methodology of interpretive/generic qualitative research approach, lack of allegiance to any conventional qualitative methodologies, method slurring, and little literature around it has promoted debate over the rigour and quality of this approach

(Caelli et al., 2003; Kahlke, 2014). Although some of the issues raised by the critiques of this approach might be valid, the proponents of generic research consider the growing number of the use of generic approaches in the research field as an indication of a need for further investigation, adaptation, and innovation in methodological approaches to fit the needs of the disciplines and researchers (Caelli et al., 2003; Kahlke, 2014). The research studies conducted within the generic research approach open up an opportunity for the development of new theoretical and methodological perspectives (Caelli et al., 2003; Kahlke, 2014; Sandelowski, 2000; Lim, 2011; Merriam & Grenier, 2019).

In order to address the pitfalls and drawbacks of generic research, Caelli et.al (2003) propose a more rigorous criteria for the design and evaluation of the generic qualitative studies. They explain that by clarifying the researcher's position, distinguishing method and methodology, making explicit the approach to rigour, and identifying the researcher's analytic lens, the researcher can increase the quality of the research study. Similarly, Kahlke (2014) has advised researchers to be reflexive, to define the boundaries of the study, and to present a "clear picture of both the research framework and the decision making process" (p. 48). Following these recommendations, I have already described what motivated me to undertake this study (see Section 1.1), and my philosophical, ontological and epistemological stance. Below, I present the theoretical lenses of the study, defining the boundaries of the research, and elaborating on my position as a researcher in the research process. Providing thick descriptions of the research method I applied, and outlining the data collection and analysis stages undertaken also helped with the clarification of the research process.

3.3. The analytical tools and theoretical frameworks

Various analytical tools and theoretical frameworks were used in the analysis of the data. As the name implies, analytical tools can be models that help the researcher with the analysis of

the data. Nation's (2007) pedagogical principles for second language teachers, Puentedura's (2013) SAMR model are the two major analytical tools deployed in Chapter Four to answer the first research question. These two models are used to guide the analysis of selected ESOL teachers' reported ICT practices. Nation's (2007) pedagogical principles is used to frame ESOL teachers' ICT pedagogy and the SAMR model framed the e-maturity level of ESOL teachers' ICT adoption and integration.

Fox and Bayat (2007) defines theory as "a set of interrelated propositions, concepts and definitions that present a systematic point of view of specifying relationships between variables with a view to predicting and explaining phenomena" (p.29). A theory serves as a guide or blueprint to the research study (Grant & Osanloo, 2014). A theoretical framework is an important part of a research study since it influences every decision being made in the research process, from structuring the literature review to selecting method and approach to analysis (Grant & Osanloo, 2014; Mertens, 1998).

There are various approaches to the selection and use of a theoretical framework. While some theoretical frameworks are chosen at the very beginning of the research process, others emerge during the data analysis phase (Grant & Osanloo, 2014). The base for the selection of the theoretical frameworks in this study emerged during the data analysis phase. In other words, the idea of using the Arena of Change with digital technologies framework (Davis, 2018) in Chapter Six emerged during the data analysis process, when other linear and mechanical ways of analysing data proved unsuccessful in explaining the complexities of the phenomenon, which is the focus of the third research question in this study. In addition, this approach to the selection of a theoretical framework reduced the possibility of the influence of preconceptions on research findings (Grant & Osanloo, 2014). Integral to the specific layers of ecosystems of the Arena framework, Davis's (2018) synthesis of concerns-based models was another

analytical tool used in the study to interpret an individual teacher's concerns at the time of adopting a specific ICT tool. The following sections offer on overview of the analytical tools and theoretical frameworks used in the order they are presented in the study.

3.3.1. Nation's pedagogical principles

Nation's (2007) set of pedagogical principles for language teachers was chosen to understand how ICT as a learning tool supports students' language learning and contribute to teachers' language learning pedagogy in the classroom. As introduced earlier in the literature review, Nation (2007) explains that a well-designed and a well-balanced language course includes an equal proportion and an even balance of all the four strands, i.e., meaning-focused input, meaning-focused output, language-focused learning, and fluency development (see Section 2. 5. 2).

Drawing on research on second language acquisition and applying the four strands, Nation (2007) formulated a set of principles to support teachers with their second language pedagogy. Nation (2007) states that the four strands and the pedagogical principles are based on "common-sense justification" and "time-on-task principle" (p. 1). He advises that through following the four strands, "it is possible to ensure that innovation does not result in misbalanced courses and that innovation builds on what we know about language learning and teaching" (p. 11).

The integration of CALL tools is an innovation and it creates disruptions in the language learning classroom ecosystem (Davis 2018). As such, it is unlikely that ESOL teachers can successfully balance their use of ICT in the classroom activities without taking Nation's advice. In other words, using Nation's (2007) set of pedagogical principles may be a possible solution for balancing classroom pedagogy when planning for ICT integration. Hence, I adopted

Nation's pedagogical principles to foreground the pedagogical purposes for which ICT was reported to be used by the selected ESOL teachers in this study.

3.3.2. Puentedura's SAMR model

The SAMR model was introduced by Puentedura (2013) to assist teachers in determining their level of technology integration and to explain how efficiently ICT was being used to enhance and transform learning. It includes four stages, namely, substitution, augmentation, modification, and redefinition, in which ICT can be integrated into a classroom. Substitution is described by Puentedura (2013) as the stage in which an analogue technology tool is just replaced by an ICT tool with no functional change. At the augmentation stage, ICT still acts as a substitute but with functional improvement. The modification stage requires a significant redesign of the task and at the redefinition stage ICT provides the possibility for creating novel tasks. Puentedura (2013) holds that ICT integration does not stop at the enhancement learning stage; it can also transform learning if integrated to its full potential. In other words, the use of ICT is at the enhancement level when its use resonates with the characteristics of the substitution and augmentation stages. According to Puentedura, the higher-order ICT integration is evident when the use of ICT enters the modification and redefinition stages, where using ICT not only enhances learning, but also transforms learning into a new phase where a significant redesign of a task previously unimaginable is achievable. Puentedura (2014) claims that ICT integration is most effective only when it is at the redefinition stage.

However, there are certain drawbacks with SAMR. According to Hamilton, Rosenberg, and Akcaoglu (2016), the context is absent in the SAMR model and it is mainly focused on the product rather than the process. Furthermore, the SAMR model is not backed up with research and suffers from a "lack of theoretical explanation and exploration" (Hamilton et al., 2016, p.

435). Also, the SAMR model does not provide a sufficiently clear definition and distinction between the stages, making it open to very different interpretations. This can, therefore, create ambiguities and encourage subjectivity in defining the differences between stages (Hamilton et al., 2016).

Hamilton et al. (2016) and Hilton (2016) argue that despite the drawbacks, SAMR has gained considerable popularity amongst teachers and education providers. Based on an analysis of some research on mobile learning, Romrell, Kidder, and Wood (2014) recommend SAMR as a particularly useful model to classify and evaluate the level of integration of mobile devices in educational environments. Hockly (2013) also recommends SAMR as a suitable framework for assessing the level of ICT integration in a language learning classroom. However, she does not provide any empirical evidence for this recommendation. Azama (2015) used SAMR as a framework to design their studies and assess the impact of ICT on language learners. Her (2015) study showed varied results on different aspects of the relationship between language learning and SAMR instructional stages. However, both researchers had a different understanding of the SAMR model and, accordingly, have applied it differently in the design of their classroom activities.

Despite the controversies surrounding the suitability of the SAMR model, I chose this model since it was recommended to teachers in New Zealand schools through professional development programmes and the TKI website. It was introduced as a tool through which teachers could evaluate and assess their level of ICT integration in their classrooms (Ministry of Education, 2018a). Next section explains the theoretical framework used in this study, i.e., the Arena of Change with digital technologies framework.

3.3.3. Davis's the Arena of Change with digital technologies framework

An ecological perspective has been adopted by numerous scholars in the field of education on topics such as school reform and leadership (Baker & Richards, 2004; Goodlad, 1987), curriculum (Brab & Roth, 2006), teacher professional knowledge (Clandinin & Connelly, 1996), and educational policy (Weaver-Hightower, 2008). The field of educational technology is no exception. Within the field of educational technology, some scholars have argued that technology adoption should be approached from an ecological perspective in which the relationships between multiple factors within the larger school context are considered (Nardi & O'Day, 1999; Zhao & Frank, 2003). Zhao and Frank (2003) applied an ecological approach to explain the factors affecting technology in nineteen schools in the United States. They argued that the ecological perspective can offer a powerful analytical framework to explain the co-evolution of both teacher pedagogy and ICT integration in schools. However, as stated by Weaver-Hightower (2008), many of these studies used the concept of ecology at a rather superficial level "often only as synonymous for environment and surrounding" (p. 154).

Concerned about the lack of a global perspective to educational changes and the importance of cultures, Davis (2018) offers the Arena of Change framework. Not only does Davis's Arena of Change framework offer the broadest possible scope (global) in human ecology, it also attributes a broader meaning to the concept of culture and its potential role in influencing the evolution of ecosystems within and across nationwide ecozones.

The Arena of Change with digital technologies framework, henceforth called the Arena for brevity, is supported by understandings drawn from theories of "ecology, [and] human ecology in particular" (Davis, 2018, p. 9). It is an "overarching conceptual framework" that brings together multiple perspectives on "the ways that education is evolving under the influence of digital technologies and vice versa" (Davis, 2018, p. 9). The Arena offers a detailed perspective

of interacting ecosystems through five sectors, namely *resources*, *political*, *bureaucratic*, *family*, and *professional* spanning the biosphere. Davis (2018) argues that the Arena helps to explore "the chaotic complexity of these processes […] leading to an increasing diversity of the K-12 schools" (p.1).

In Davis's Arena framework, teachers are perceived as *keystone species*, a term used to describe a species that has a disproportionately large effect on its environment. Unlike Zhao and Frank (2003), who foresee the displacement and extinction of teachers' role by ICT, Davis (2018) believes that any "teacher who adapts his or her practice to adopt IT, does not become extinct". She sees the adoption and integration of ICT as "change that stimulates changes in the behaviour of the keystone species, i.e., teachers", but it could never replace them (Davis, 2008, p. 440). Teachers in this case are keystone species because they "maintain the balance in the flow of energy and matter" in the classroom ecosystem and "their introduction or removal severely disrupts the normal balance of the ecosystem" (Davis, 2018, pp. 10-11). Teachers' behaviours vary with the changes in the ecosystems they are nested in (Davis, 2018). As seen in Figure 3.1, the Arena framework consists of different layers of ecosystems, some of which are nested within each other. The concept of ecosystems refers to the environments in which a particular community of living species coexist with non-living matter. A large cluster of ecosystems with distinct ecological features is called an ecozone, and the collection of all these ecozones forms the ecosphere, i.e., the whole world.

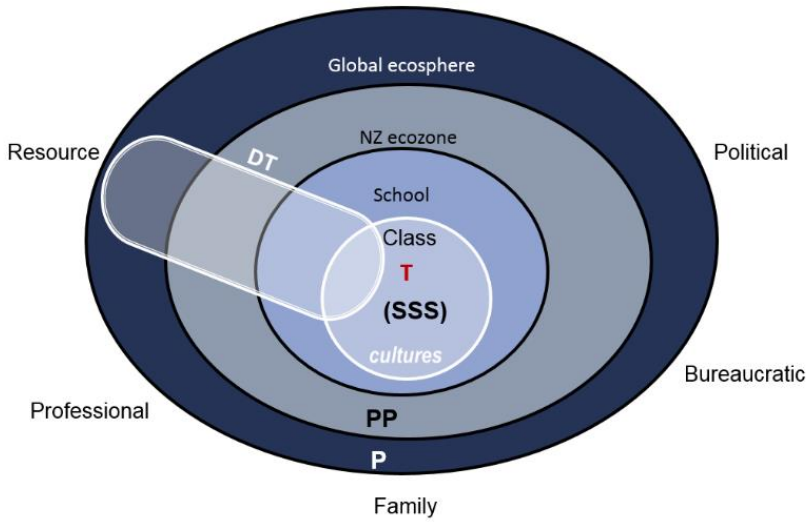

Figure 3. 1. The Arena framework with a two-dimensional helicopter view of a classroom ecosystem adopted from Davis (2018).

Key: DT, Digital tools; PP, parents; SSS, students; T, the teacher at the centre of the Arena

Figure 3. 1 is copied with permission from illustrations of the Arena in Davis (2018) to explain the relevance of this framework to this study. A class at the centre of the Arena is recognised to be an ecosystem of its own and includes the teacher and the students. It is nested within different ecosystems (that is, from the local to the global layer, namely, the school ecosystem, the national ecozone, and the global ecosphere).

As Davis (2018) explains, the global ecosphere in the Figure 3.1 has influences grouped into five main sectors: family, professional, resource, political, and bureaucratic. The influences extend into all the different layers of the Arena. The family sector of influence includes the students' parents (P) and their home cultures. Depending on where these parents are located, they can be positioned within the national or global layer. The professional sector relates to the influence of the professional learning opportunities available to teachers through different ecosystems such as online courses, universities, schools, and colleagues. The resource sector of influence includes digital tools (DT), both co-evolving along with the educational ecosystems as well as evolving independently. IT technicians and executives are part of this

ecosystem. A digital tool evolves in an ecosystem too, such as a company that works with a cloud-based infrastructure. The political sector refers to the policies set out at national levels by governments, and at the global levels by international organisations such as UNESCO or OECD. The bureaucratic sector pertains to the requirements imposed by administrators, such as the national and international examination bodies. It also relates to the impact of national educational policies on the teachers' pedagogical ICT practices.

Davis (2018) points out that although balance and harmony may appear to be the optimum state of existence for an ecosystem, ecologies are not static and they evolve over time, stressing and/or supporting the neighbouring and overlapping ecosystems to co-evolve. Hence, all ecosystems evolve and change in relation to each other while striving to maintain a state of equilibrium. ICT and educational settings are continuously co-evolving and the ecological perspective that the Arena framework affords can support us to identify the diverse factors impacting teachers' practices with ICT, including ESOL teachers.

Several different studies have drawn on the Arena framework. For instance, Zaka (2013) used the Arena to clarify the complexities involved in the implementation of blended teaching and learning in a New Zealand secondary school. Karabulut (2013) adopted the Arena in her doctoral dissertation to explore the factors that impact university level language teachers' ICT integration at a university in the United States as the Arena offered a holistic lens which she could use in her analysis. However, her use of the Arena is at the surface level, her analysis is linear and she does not incorporate the relevant terminology when using the Arena.

I have chosen Davis's (2018) Arena framework because it allows for identification, exploration, and explanation of the wide-ranging factors that influence ICT adoption. The global perspective that emphasises the influences of cultures is particularly helpful in explaining the international nature of ESOL and the influences it receives from other contexts

in the global domain. In other words, this framework offers the means of "understanding how and why this [ICT adoption process] works, or could work, across all ecosystems" (Davis, 2018, p. 15). It is also in line with my constructivist research paradigm, which adopts a holistic point of view and acknowledges the influences of various ecosystems on the development of a phenomenon. Davis's synthesis of concerns-based adoption model is another tool used in Chapter Six to elaborate on the specific layers of ecosystems that are integral to the Arena framework. This is explained next.

3.3.4. Davis's synthesis of concerns-based adoption model

Understanding each person's concerns when encountering and implementing an innovation can help with more individualised support for that person (Davis, 2018). A number of concerns-based adoption models have been researched, including Hall and Hord's (2001) concerns-based adoption model (CBAM), Rogers's (2003) diffusion of innovation, and Sherry and Gibson's (2002) learning adoption trajectory (LAT). Given the choice of the Arena, Davis's (2018) synthesis of concerns-based adoption models was chosen in this study to interpret an individual teacher's adoption of ICT tools. Davis's concerns-based adoption model consists of four stages, namely, "self", "task", "impact", and "change agent" (p. 143). It provides a simple but inclusive account of each teacher's concern in their process of change with ICT. It explains that at the very early stages of adoption, teachers' concerns are mainly centred on *self*, raising their awareness of the innovation and developing the skills needed for its use. As the awareness and skill are developed, teachers' concerns from *self* move to *task*, including evaluation of the deployment of the ICT in their context. The *impact* of the use of the innovation for the intended purpose is the next stage of concern, which, depending on the results, may lead either to rejection or to more widespread use of the innovation. Becoming a *change agent* is the last stage within which some teachers become avid users of the innovation, willing to create change

in their environment. Such teachers enthusiastically encourage and make other teachers aware of the value of the innovation. Davis (2018) stresses that these stages of concern are not linear and, at times, multiple stages will be in progress as teachers move between these stages of concern with specific ICT innovations relevant to their teaching.

3.4. Research methods

Research method concerns the practical aspects of the research study and the strategies and techniques used for conducting a research, including the decisions on sampling techniques, the selection of participants, data collection strategies, and data analysis stage (Kothari, 2004). In the following, I will explain and elaborate on how this study was conducted, the processes taken that lead to the final decision on the selection and application of the research method, and the challenges resolved in each of these processes.

3.4.1 Participant recruitment and selection procedures

The participants were recruited from both the North and South Islands in New Zealand. The recruitment of the participants was a challenging process and involved a number of strategies. The lack of sufficient volunteers from my locality to participate in the study led to both pragmatic (convenience) sampling approach and snowball sampling approach, both a subcategory of non-probability sampling (Dörnyei, 2007). Nonprobability sampling is used when randomisation is not important in the selection of the participants, the generalisation of the results is not the aim of the researcher, and/or when resources, time and workforce are limited (Etikan, Musa, & Alkasim, 2016). Saumur and Given (2008) define a convenience sampling as a kind of sampling in which "research participants are selected based on their ease of availability", i.e., they are "most ready, willing, and able to participate in the study" (p. 124). The snowball sampling is also used when it is difficult to access suitable group members,

hence, the volunteered participants were asked to identify or recruit other participants (Dörnyei, 2007). Being an outsider to the context of the study, the first teacher whom I contacted and interviewed was introduced through one of my supervisors and experts. Through her I was introduced at an English language teaching symposium, which was organised by CANTESOL in Christchurch, New Zealand. My first attempt for participant recruitment was in this symposium. I was offered a time by the organisers of the symposium to briefly explain about my research and ask for volunteers. Initially, four teachers expressed interest in the research, two of whom were from the tertiary sector, one from secondary, and one from language schools. Through my conversations with the volunteers, I realised that, in the aftermath of Christchurch earthquakes, the number of ESOL students and, as a result, the need for ESOL teachers had decreased dramatically, so much so that many language schools were on the verge of closing down. This situation had jeopardised ESOL teachers' working opportunities and had put extra pressure on them. Against this backdrop, it was understandable that few were willing to volunteer. Furthermore, I came to the realisation that there is a considerable difference between ESOL teachers from different sectors in various ways, including their teaching practices and teaching material. Hence, I narrowed my scope from ESOL teachers in general to ESOL teachers working in New Zealand secondary schools in particular. This decision was made first due to my impressions from my conversation with the teachers and the special circumstances that these teachers appeared to be dealing with.

My second attempt at recruiting participants and familiarising myself with their contexts was to participate in one of the secondary ESOL teacher cluster meetings. Only four teachers attended the meeting, which in itself might have been an indication that such meetings was not a priority for the traumatised teachers at that particular point in time, especially since the meeting was held in one of the severely earthquake damaged areas of the city. In that meeting,

one teacher volunteered to take part in my study under the condition that the interview took place out of the school and that she remained anonymous. This led me to recruit the participants from a wider ESOL teacher population from across New Zealand through an invitation for participation email that was distributed through the Ministry of Education ESOL Online forum mailing list (http://esolonline.tki.org.nz/). ESOL Online is a social and educational networking website for teachers in New Zealand which provided access to a larger number and a wider range of ESOL teachers. The invitation email briefly described the research topic, the selection criteria for the participants, the tentative time required for the interview, a description of the researcher, and contact information. Twelve of the teachers interviewed were recruited through this medium. This method of recruiting was then followed using a snowball technique through which teachers helped to recruit their acquaintances (Babbie, 2005; Goodman, 1961). Eventually, a total of twenty-one secondary ESOL teachers from both the North and South Islands participated in New Zealand in years 2013 and 2014.

The size of the sample was another challenge in the research process. There is no prescribed or recommended fixed sample size in qualitative research and sampling can continue depending on the participants, research purpose, population characteristics, and data analysis method until theoretical saturation occurs (Guest, Bunce, & Johnson, 2006; Neuman, 2006; Smith, 2015). Glaser and Strauss (1967) first introduced the concept of "theoretical saturation" in qualitative research and describe it as a stage in which no new data is recognisable during data collection. It is at this stage that the researcher can confidently claim that the data is theoretically saturated, as they observe "similar instances over and over again" (Glaser & Strauss, 1967, p. 65). Accordingly, I ceased participant recruitment and data collection upon reaching theoretical saturation. I began data analysis while I was collecting my data and I stopped recruiting

participants when there appeared to be no new themes emerging and similar themes such as the issues with context and teachers' beliefs kept reoccurring.

Table 3.1 provides a list of the teachers' pseudonyms, gender, age, prior teaching background. These participants were mainly female (eighteen females and three males) and their ages ranged from twenty-four to sixty-eight years with a median of 54 years. In terms of age and gender the sample appears to be representative of the national population. In a study of the demography of ESOL teachers in New Zealand, Haddock (1998) concluded that older and female teachers appear to form a high percentage of the population of ESOL teachers.

Table 3.1. Demographic characteristics of participating ESOL teachers, presenting their pseudonym, gender, age, and prior teaching experience in descending order of age (n=21)

Name	Gender	Age	Prior teaching background
Rebecca	F	68	Special needs
Becky	F	67	English
Fred	M	67	English computer consultant
Melanie	F	64	English and History
Mary	F	64	English
Joseph	M	64	EFL (overseas)
Jean	F	62	Primary teacher
Donna	F	59	Primary teacher
Heather	F	55	Primary teacher
Nora	F	55	Primary teacher, EFL (overseas)
Claire	F	54	ESOL teacher
Stephanie	F	54	ESOL teacher
Amy	F	50	Digital technology EFL (overseas) languages teacher (Japanese)
Sue	F	50	Science
Gloria	F	49	EFL (overseas)
Kali	F	44	ESOL teacher
Linda	F	30	ESOL teacher
Jamie	F	30	EFL (overseas), Special needs teacher
Sophie	F	28	ESOL teacher
Sandra	F	27	ESOL and Japanese teacher
Nick	M	24	Physical education and English

The participating teachers also came from various teaching or career backgrounds. Some were originally primary teachers (or came from other disciplines), who had moved to ESOL departments due to personal and professional preferences. Four of the teachers moved from primary schools to teaching ESOL at a secondary school. Eight of the teachers came from other disciplines such as English, Physical Education, History, Science, and ICT, and eight of the teachers were teaching other languages as well as ESOL. Out of all the teachers interviewed, five had the experience of teaching English overseas prior to becoming an ESOL teacher.

3.4.2. Data collection

Several data gathering methods are often expected in a qualitative research study. ESOL teacher interviews were the primary source of data complemented with two secondary sources to support triangulation. It may be useful to note that various methods of collecting data, including surveys, focus group interviews, and observations were considered at the initial stages of the research. However, since not enough was known for designing a survey about the factors that influences the use of ICT in ESOL teaching particularly in New Zealand context, conducting interviews was selected first. As I progressed with the interviews, I became less convinced that designing a survey would add much to the findings. In particular, the multi-layering analysis of the interview data described later became increasingly complex and extra time and effort was needed for a deeper analysis. In addition, the Arena framework, which was adopted following deep analysis of the interview data, does not lend itself to a survey. In addition, post-earthquake conditions restricted the opportunities to connect with local ESOL teachers and become familiar with the ESOL context. This consequently increased the challenges and reliability of survey design and participation procedures.

The use of focus group interviews and observations was also dismissed due to practical and pragmatic limitations. First, the major focus of the study was on the teachers' interpretations'

of their subjective experiences. Observations would have added value and enriched the data with a focus on evaluating teachers' practices, but they do not particularly help with understanding what teachers know, believe, or think (Borg, 2015). Second, focus group interviews within the schools were not practical. Seven of the ESOL teachers reported being the only ESOL teacher in the school, and those with more colleagues stated that they did not often meet other ESOL teachers due to the variation in their working hours. Anonymity was another important issue. Some of the teachers understandably insisted to remain anonymous or were unwilling to share their thoughts, perspectives, and personal experiences with others. A pilot with one group interview of two people confirmed this concern when one of the teachers started to express her feelings and concerns openly as soon as the other participant left. The geographical distance between the researcher and the participants on the one hand and among the participants themselves on the other, further complicated the use of additional data collection methods. The sum of these reasons led to individual ESOL teacher interviews as the primary source of data collection.

Within the qualitative paradigm, any type of data can serve as a text, ranging from individual interviews and focus group conversations to observations and written documents (Flick, 2009; Neuman, 2006). In addition to the primary source of data, professional conversations with experts in the field and the analysis of relevant documents served as secondary sources of data to help to validate, elucidate and clarify topics and themes as they emerged.

Primary source of data: ESOL teacher interviews. Kvale (1997) draws attention to the lexical structure of the word interview, arguing that in "inter-view" a researcher's aim is to "understand the world from the subjects' point of view, to unfold the meaning of people's experience" (pp 1-2). Libakova and Sertakova (2015) refer to interview as "a conversation with a set purpose and set tasks which are related to obtaining information relevant to the ongoing

research". (p.114) Often regarded as one of the major and most effective methods of comprehending an individual's thoughts, attitudes, and experiences (Denzin & Lincoln, 2011), Rubin and Rubin (2012) describe qualitative interviews as a means of probing into the interviewees' mind:

> Through qualitative interviews, you can understand experiences and reconstruct events in which you did not participate. Through what you hear and learn, you can extend your intellectual and emotional reach across time, class, race, sex, and geographical divisions (p. 1).

Through interviews, "beliefs can be articulated orally and teachers are able to provide a verbal account of the cognitions underpinning their work" (Borg, 2015, p.270). Acknowledging the criticism that applies to interview data, such as the fact that what teachers say may not necessarily reflect what they think or do, Borg (2015) values this approach to data collection and regards it as the most commonly adopted strategy in the studies of teacher cognition and thinking. Interviews are valuable tools since they allow for "tacit and unobservable aspects of teachers' mental lives to be made explicit" (Borg, 2015, p.225). In other words, through interviews, how individuals sense, remember, and create meaning out of their experiences can be discovered (Creswell, 2013; Patton, 2004; Smith, 2015).

Twenty one secondary ESOL teachers were individually interviewed once by the researcher, with each interview lasting between 50 and 90 minutes. Where necessary, follow-up conversations or written questions were sent to ask for further clarification. The interviews in this study were conducted in the form of a combination of semi-structured and unstructured (open-ended) interviews. The questions in semi-structured interviews aimed to guide the interviewees on the topic and to clarify what was expected and required of them (Schwandt, 2001). On the other hand, unstructured interviews allow for greater flexibility "to take the

[participants'] response into an area that the researcher did not consider" (Boudah, 2011, p. 138). Hence, combining both semi-structured and unstructured interviews helped me to lead the conversation towards the focus of the study and cover more or less the same ground in all interviews, while still allowing myself to ask follow-up questions. It also provided the participants with some general guideline questions, as well as affording them the freedom to discuss the aspects that might have been invisible to me. Furthermore, using both approaches has the potential to create more comprehensive results and reduce the impact of researcher bias on the study (Boudah, 2011).

The interview questions for this study were shaped by two main questions suggested by Moustakas's (1994) and Seidman's (2013) guidelines on conducting interviews about phenomena. Moustakas (1994) argued that in order to arrive at a thorough description and understanding of the participants, they should be asked two main questions:, "What have you experienced in terms of the phenomenon?", and "What contexts or situations have typically influenced or affected your experiences of the phenomenon?" (Creswell, 2013, p. 61). Similarly, Seidman's (2013) guidelines also suggest that phenomenological interview questions should focus on three main areas, i.e., the life history of the participant, the details of the lived experience, and the meaning of the experience for the interviewees. During the interviews, I invited the teachers to talk about themselves, their professional history, and their experiences and feelings towards ICT uptake and integration in their professional life. I carefully listened to the participants, took notes when more details were needed, and asked questions when appropriate. Some of these questions were: "Could you please introduce yourself and tell me how you became an ESOL teacher?"; "What are your experiences with ICT tools?"; "How do you use ICT tools in your professional life?", and "What influences your ICT practices?" A sample of guidelines for interview questions is presented in Appendix C.

The answers to these questions prompted further questions for clarification and elaboration. For instance, when teachers referred to lack of time, I tried to explore further what they meant by that. What responsibilities engaged the teachers? Did it relate to in-school or out of school activities? Similarly, when a teacher referred to the emotional needs of their students, I tried to investigate to see why this was important for the teacher.

Some interviews were conducted face-to-face and, because of geographic distance, others were held online via Skype or phone. In some cases, follow-up questions were used when further clarification was needed. The face-to-face interviews were conducted in the place most convenient for the participants. These arrangements were negotiated through email. In addition, the participants' information sheet (Appendix A) and the consent form (Appendix B) were emailed to the participants, along with an outline of the interview questions (Appendix C) for the five teachers who requested them prior to the interview. With the informed consent of each interviewee, the interviews were digitally audio-recorded, transcribed, and analysed. The transcripts were then given to the participants for confirmation, amendments, and/or additions.

Neuman (2006) argues that interviewers play a complex role in any interview. They need to remain objective, impartial, and neutral while they are developing a friendly relationship with the interviewees so that the latter feel safe and comfortable when discussing their feelings. I tried to create a friendly atmosphere during the interview process, starting with an initial introduction of myself and providing the participants with the choice of place and time. I also gave them the option of skipping any questions they did not feel comfortable about answering, but the participants were open to answering all the questions.

Secondary sources of data: experts and documents. Analysis of conversations with experts and purposefully selected documents were the secondary sources of data. Seeking experts' opinion is a widely used methodological approach in educational research for "collecting,

analysing and evaluating of information" (Iriste & Katane, 2018, p. 74). Expert interviews can be unstructured and less standardised in nature (Bogner, Littig & Menz, 2009; Libakova & Sertakova, 2015) if the researcher wants to offer freedom to the experts to voice their personal points of view and express their opinions about what they regard as relevant about the situation in question (Libakova & Sertakova, 2015). Unlike other types of interviews, the focus of experts' interviews is not on the individual's personal life and biography, but rather is on their specific experiences and professional knowledge which is gained through their roles, actions, functional status, and responsibilities within an institution or organisation (Bogner, Littig, & Menz, 2009).

The experts were selected based on their knowledge and expertise on the topic of investigation and their availability. Okoli and Pawlovki (2004) consider heterogeneity among the experts an important criterion in selecting the number of experts. In other words, the greater the heterogeneity in the field of expertise amongst the experts, the lower number of experts needed. I took concerns raised by Okoli and Pawlovki (2004) when recruiting the experts.

In this study the interviews were often informal and took the form of a professional discussion. Following Libakova and Sertakova's (2015) recommendations on expert interview analysis, the collection of data from experts started with recording the conversations, then notes were taken from the most important and relevant information, and then were processed and analysed thematically. It is worth mentioning that when the expert was also a supervisor, the interview could mingle with supervision advice.

Table 3.2 describes the seven experts consulted and their roles in the research process. It also provided information on the number of the meetings with each expert, their area of expertise, the topics consulted about, and their contribution to the research. These experts' areas of expertise varied widely. They were consulted at different times, some at the very early stages

to gain insights of the context, and some during or towards the end so that I could verify, clarify, and triangulate some of the findings that emerged from the primary data. For example, when the participating ESOL teachers referred to some context-related issues, such as professional development opportunities, I consulted the issue with the ESOL facilitator (Fry) and teacher educators (Davey and Howard) to confirm if my interpretation and understanding of the situation was consistent with the teachers' report(s).

Table 3.2: The Experts, their Expertise, and their Contribution to the data (n=7)

Name role	Role(s)	Expertise	Estimated number of 'interviews'	Topics of consultation	Contribution to the data
Ronnie Davey	expert; former supervisor	Teacher educator in the field of English language and literature	Three	Teacher education in New Zealand ICT initiatives undertaken by the Ministry of Education	Insights into New Zealand teacher education programmes and ICT-PLD initiatives
Juliet Fry	expert	Regional ESOL PLD facilitator	Four	New Zealand education system New Zealand curriculum PLD for ESOL teachers New Zealand ESOL policies	Insights into the New Zealand educational context and ESOL
Una Cunningham	expert and supervisor	Professor of education, linguistics, and multilingualism; teacher educator	Six	CALL in tertiary education in New Zealand The initiation and coordination of first Master of Computer Assisted Language Learning programme in New Zealand	Insights into the field of second-language teacher education in general and in New Zealand, in particular. Enabled me to audit CALL courses in which included ESOL teachers
Jocelyn Howard	expert and supervisor	Teacher educator in inclusive learning environments and diverse learners including ELLs	Two	ESOL teacher education programmes	Assisted participant recruitment
Niki Davis	expert and supervisor	Distinguished Professor of e-Learning; teacher educator (ICT)	Three	New Zealand education system Change with ICT in education	Insights into ICT initiatives in New Zealand and the Arena framework with its ecological perspective.

Stuart Wise	expert	Teacher educator (secondary music); coordinator of a secondary teacher education programme	One	Teacher education programmes	Insights on how ESOL is treated in secondary teacher education The provisions to address ESOL in secondary teacher education in New Zealand.
CELTA Expert (anonymous)	expert	CELTA course coordinator	One	CELTA syllabus and ICT integration within CELTA	Insights on CELTA courses and how they are conducted

Analysis of the relevant documents was the other secondary source of data. Documents can take various forms and include any type of "written, printed, visual or electronic material that provide information or evidence" (Savin-Baden and Major, 2013, p. 403). The ease of accessibility and availability, time- and cost-effectiveness, and the non-reactive and stable nature of documents were some of the advantages of documents over other sources of data (Bowen, 2009; Merriam, 1988). Document analysis requires a system for selection and a systematic process of evaluating and reviewing (Bowen, 2009). As presented in Table 3.3, the documents were selected in this study for one or both of the following reasons:

1. Relevance to the themes developed from the interview data
2. Recommended by one or more of the seven experts and/or mentioned by teacher participants

Documents can have different functions as data sources and can be used for a variety of purposes in a research study. Bowen (2009) identified the five main functions for documentary analysis as follows,

1. Gather knowledge and insight on the background and context in which the research is taking place and participants operate;
2. Supplement the data gained through interviews;
3. Verify the findings from other data sources;
4. Suggest questions that need to be asked; and
5. Track changes and developments.

Brown's (2009) categorisation of the functions of the documents were used to clarify the functions that the documents play in this study in Table 3.3. These documents are cited mainly in Chapter Five and to a lesser extent in Chapter Six to provide knowledge of the background, supply, and/or verify other data sources.

Bowen (2009) describes the analysis of documents as an iterative process of "skimming (superficial examination), reading (thorough examination), and interpretation" combined with "elements of content analysis and thematic analysis" (p. 32). Guided by Bowen (2009), the documents were first skimmed through to identify the ones with relevant content to central questions and the research topics, and to discard the irrelevant ones. As recommended by O'Leary (2014), in this stage, I also explored the documents based on their type, authenticity, the audience aimed for, year of production, who produced them, and purpose of production. Some of this information is presented in Table 3.3.

Bowen describes the thematic analysis stage as a stage in which each of the emerging themes from the documents becomes a category for analysis, involving a more careful reading and re-reading of the documents. Bowen (2009) further explains that predefined themes from other sources of data collection such as interviews can be used for content analysis of the documents if the analysis of the documents is used to supplement other methods applied in the research. Since the documents were the secondary source of data and my aim was to gather knowledge of the background context, supplement and verify interview data, the themes and codes generated from that primary source were used as the basis for the analysis of the documents.

Eight documents were used to support the interview data. They were drawn from a range of authentic sources, including The Ministry of Education (http://education.govt.nz) web portal, Te Kete Ipurangi (TKI) (https://www.tki.org.nz) web portal, New Zealand Quality Authority (http://www.nzqa.govt.nz), and a number of university webpages.

Table 3.3: Documents analysed (n=8)

Title	Author	Date	Type of the document	Key information	Criteria for selection 1, 2, or 1 and 2 (see above)	Purpose/ Function (Bowen, 2009) (see above)
Language and Literacy Education papers	Waikato University	2014	Web portal	Lack of focus on CALL as an agenda	1 & 2	1 & 2
Cambridge English for Teaching CELTA, Syllabus and Assessment Guidelines (3rd ed.).	University of Cambridge ESOL Examinations	2010	Book	Lack of presence of any topic on the integration of CALL in the course content.	1 & 2	3
Scholarships for teaching English in schools for speakers of other languages (TESSOL).	Ministry of Education	2018	MOE Webpage	Initiatives for ESOL teachers' PLD and ESOL scholarships	1	1 & 2
Understanding teaching-as-inquiry	Ministry of Education	2011	PDF file	teaching-as-inquiry, its use, and implications	1	1 & 2
ESOLOnline	Ministry of Education	2015	MOE Webpage	The online resources available to teachers at the national level and how they promote ICT integration.	1	1 & 3

The New Zealand Curriculum	Ministry of Education	2007	TKI web portal	New Zealand curriculum and the position in ESOL in that curriculum	1 & 2	1 & 3
NCEA	New Zealand Qualifications Authority (NZQA)	2018	NZQA web portal	To gain knowledge on NCEA assessment	1	1
Digital Assessment: 2016 NCEA digital trials and pilots.	New Zealand Qualifications Authority (NZQA)	2016	NZQA web portal	Progress towards the digitalisation of NCEA exams	1	1 & 2

3.4.3. Data analysis and reporting

Considering the descriptive nature of generative qualitative research (Merriam & Grenier, 2019), a number of data analysis phases were undertaken. Some of the phases were successful and some were not. It is worth mentioning that "verbal counting" method was used to report on the number of the participants. According to Sandelowski (2001) verbal counting occurs when "researchers imply numbers without actually giving any … [using] words such as a few, some, many, and most" (p. 236). However, this should be accompanied by advising the readers what their "pronouns connoting indeterminate quantity will mean" through defining them by numbers (p.237). For example, *few* or *rarely* is used when something occurs in less than 20% of the participants or *common* is used when something occurs in more than 50% of participants. In the reporting the data in this study, I will be using *few* when something is reported by less than 20% of the participants, *some* and *several* will be used when something is reported by 21% to 50% of the participants. *Many* and majority would be used to refer to something reported by 51-85% of the participants and *most or almost all* will be used to refer to something that reported by 86-100% of the participants.

First, in order to explain the participant teachers' ICT practices, a layer of deductive analysis using Nation's (2007) second language teaching principles and Puentedura's (2013) SAMR model (see Sections 3.3.1 and 3.3.2) as analytical tools was adopted. Nation's (2007) principles helped in making sense of the ESOL pedagogies and the pedagogical purposes for which the ICT tools were used. SAMR a model for understanding the e-maturity level of the ICT users was then used to explore different levels of ICT integration and the diversity amongst the teachers' ICT practices. These results are presented in Chapter Four.

Next stage was to explore the reasons for such diversity amongst the teachers. Hence, a thematic analysis was attempted. To do so, I used the list of categories and themes (Appendix E) developed from close analysis and coding of the first four interview data (Appendix D). According to Smith and Osborn (2008), "one can either use the themes from the first case to help orient the subsequent analysis or put the table of themes for Participant 1 aside and work on Transcript 2 from scratch" (p. 73). While I tried to be wary of the "repeating patterns" and also vigilant of the "new issues emerging" (Smith & Osborn, 2008, p. 73), this approach helped me to orient the analysis of the subsequent participants' data. The remaining transcribed interview data were then analysed and a number of themes emerged. Some of the themes emerged included factors related to the teacher such as teacher knowledge and prior learning, factors related to the context such as student needs and school culture, and factors related to the technology such as availability of relevant resources. In order to expedite the process of data analysis and also to make it more accurate and explorative, I used the qualitative data analysis tool NVivo software to assist me in organising and scanning the data. Furthermore, to avoid making my analytical field of vision narrow in this process, I refrained from an early reading of the literature (Braun & Clarke, 2006).

Guided by the insights from the initial thematic analysis, the literature was then consulted for further insights and clarification. Borg's (2015) model of teacher cognition was then used to frame the presentation of the emerged themes in Chapter Five. According to Borg (2015) teacher cognition influences teachers' decision making process and their classroom practices, which in itself is influenced by range of factors, including teacher schooling, professional training and development, and contextual factors.

Although the thematic phase of analysis provided insights on the factors that were reported to influence the teachers' ICT practices, its linear and mechanical approach was unsuccessful in

explaining the diversity in teachers' ICT practices and the relations and interrelations between various influences. For instance, I was puzzled by the practices when I contrasted three very different ESOL teacher participants, namely Amy, Fred, and Jean. Amy and Fred appeared to have good ICT knowledge and enthusiasm towards the use of ICT. However, despite the fact that ICT was an indispensable part of her teaching in the other languages (Japanese and French), Amy deliberately avoided its use with her ELLs. On the other hand, Fred appeared to be very successful in his ICT integration with his ELLs. On the other hand, Jean, who was of the same age as Fred and was also enthusiastic about ICT integration, was not so successful. Seeking an explanation for these contrasting behaviours, led me to Davis' (2018) Arena framework.

Hence, data analysis in this study did not start with the Arena as its theoretical framework; rather, the use of the Arena framework as an additional tool emerged from the complexity that became evident as the phases of analysis increased. This final phase of data analysis was conducted by mapping each of the three vignettes in the Arena framework (Davis, 2018) to describe and explain the phenomenon under study. This mapping into the ecosystems and sectors enabled elaboration on the connections between different aspects of the phenomenon and the existing complexities within the phenomenon in the context. Each Arena then became the basis of the sketch for a vignette of one ESOL teacher.

Traditionally, vignettes have been commonly used as a data collection technique (Finch, 1987). However, Ely, Vinz, Downing, and Anzul (1997) introduced vignettes as a method to present data. They describe vignettes as:

> [...] compact sketches that can be used to introduce characters, foreshadow events and analysis to come, highlight particular findings, or summarise a particular theme or issue in analysis and interpretation. Vignettes are composites that encapsulate

> what the researcher finds through the fieldwork. In every case, vignettes demand attention and represent a growing sense of understanding about the meaning of the research work (p. 70).

I chose the approach described by Ely et al. (1997) when using vignettes, since it allowed for a more comprehensive interpretation and representation of the phenomenon (Barter & Renold, 2000). Through the use of vignettes I was able elucidate a more holistic picture with an in-depth exploration of the situational context and influential variables.

Ely et al. (1997) introduce three forms of vignettes to represent data: a portrait, a snapshot, and a composite. However, it was Blodgett, Schinke, Smith, Peltier, and Pheasant (2011) who clearly described how these three types of vignettes differ, based on the descriptions provided by Ely et al. (1997) and Spalding and Phillips (2007):

> (a) A portrait represents an individual's character and experiences based on what was said; (b) a snapshot provides a descriptive account of what was observed in a situation; and (c) a composite depicts a mix of experiences amalgamated into a single all-encompassing narrative (p. 525).

Since the aim of presenting the vignettes was to illustrate the complexities and challenges associated with integrating ICT in ESOL secondary contexts as described by the teachers, the vignettes took the form of portraits. This form of vignette helped me to describe the unique situation of each individual teacher, which influenced their perceptions, attitudes, and practices.

The selection of cases in a research study can be "random" or "information-oriented" (Flyvbjerg, 2006, p. 229). As the name implies, random selection refers to the selection of cases randomly from a large sample. In contrast, the information-oriented selection is based on the logic that not all cases provide rich data. Hence, the cases are selected based on the

characteristics they demonstrate and the level of information they provide (Flyvbjerg, 2006). The selection of cases in this study was based on information-oriented selection. Jean, Fred, and Amy emerged as three contrasting and independent cases. They provided rich accounts of their life, which were used for mapping in the Arena. The vignettes of these three cases present a holistic picture of how each of these individual ESOL teacher's behaviour was influenced by various ecosystems. Each individual vignette provide a comprehensive description of an individual teacher's ICT practices and contexts, and when compared together, they presented varying levels of ICT integration in their practices.

I adopted a constructivist analytic approach to analyse the three cases. A constructivist analytical approach has a "strong deductive element because it begins with theories and assesses their comparative strength in understanding and explaining empirical cases" (Blatter, 2008, p. 70). In this approach, I used Davis's Arena framework with ICT in education to deduce empirical evidence and to argue the causal relations with the aim of answering the 'how' and 'why' of secondary ESOL teachers' use of ICT in New Zealand. The vignettes are presented and discussed in Chapter Six.

3.4.4. Researcher positionality

As a researcher, I have an outsider's position in the context of this study because I have neither studied as a student nor worked as an ESOL teacher in any New Zealand school. Such a stance has both positive and negative sides. The positive side is that I was able to view and study the context with a fresh perspective, not affected by the biases that might impact an insider's interpretation of the data. On the other hand, not being an insider to the context, there was a risk of overlooking some aspects of the context and its underlying complexities, which may only be easily visible to a person who is working in the system. The secondary sources of data were helpful in addressing this weakness.

Furthermore, although I have an English language teaching background, I have always taught in an environment where English was considered a foreign language (EFL). This environment is different from ESOL environments in terms of the objectives of the lessons, materials taught, and classroom demographics. For instance, EFL courses usually consist of homogeneous students taught a pre-determined textbook; however, this was not the case in the case of the ESOL programmes in this study.

My personal experience as an ELLin another English-speaking context and familiarity with some of the possible feelings that ELLs may have made me vulnerable to potential bias. I was aware that this could influence my interpretation of ELLs' needs and conditions. In other words, while this familiarity made me more sensitive towards the student-related issues, there was the possibility of me overemphasising it because of my prior experiences and possible biases. Finally, belonging to the so-called generation of digital natives myself, I was aware that I could have preconceptions and biases regarding older teachers' digital competence which can influence my interpretation. Though Manen (2007) suggests that it is almost impossible for a researcher to filter out their personal experiences from the subject in question, I made use of secondary source of data, to harness the influences of possible biases.

3.4.5. Trustworthiness: Qualitative validity and reliability

Trustworthiness is "the way in which qualitative researchers' transferability, credibility, dependability and confirmability are evident in their research" (Given & Saumure, 2008, p. 895). Such concepts stand in parallel to generalisability, internal validity, reliability, and objectivity in quantitative research. Different procedures have been suggested to evaluate the quality of qualitative research, reflecting interpretive concepts (Seale, 1999). However, to avoid any unnecessary confusion, Creswell (2013) and Franklin, Cody, and Ballan (2009) refer to these concepts as qualitative validity and qualitative reliability and suggest a set of strategies

to ensure the quality of the qualitative study. In this study, I have adopted this terminology and followed their suggested strategies for this research as outlined below.

A number of procedures were adopted to ensure validity throughout the study. The first phase concerned the main data collection tool. Before the main data collection stage, I conducted six pilot interviews to validate my own interviewing skills and the interview questions. The pilot interviews resulted in both major and minor changes in the process of data collection. Through the pilot interviews, a couple of the interview questions were altered in order to elicit more specific and detailed information from the interviewees. For example, the interview questions were initially designed to elicit and compare the teachers' use of ICT based on individual teachers' self-report, with direct questions that focused on the characteristics ascribed in the literature to digital natives and digital immigrants. For example, teachers were asked if they considered themselves multi-taskers when comparing themselves with the other generation. However, I realised that such characteristics become more visible when elicited indirectly through teachers' self-reports on their own practices. Furthermore, I eliminated those questions that resulted in repetitive answers and modified those that seemed ambiguous to the interviewees in order to make them more easily understood. I also attempted to explore the same concepts in various ways and via similar but not identical questions, in order to increase the internal validity of the interview process (Franklin et al., 2009).

Applying a number of other strategies at the data analysis stage also provided me with the power to increase qualitative validity and reliability. Triangulation, member-checks, peer debriefing, prolonged engagement, rich description, clarifying researcher position and bias, and seeking feedback from an external reviewer are among the techniques recommended by various researchers (Boudah, 2011; Creswell, 2013; Franklin et al., 2009; Guba & Lincoln, 1994; Yin,

2011). Creswell (2013) recommends that the researchers should engage in a minimum of two or more of the aforementioned strategies in order to assure the quality of their work.

Data triangulation involves "collaborating evidence from different sources to shed light on a theme or perspective" (Creswell, 2013, p. 251). Yin (2011) explains that conclusions drawn from multiple sources, methods, and theories are more valid and convincing than those drawn from one single source. Hence, this study used secondary sources of data to validate the interview data and analysis.

The secondary sources of data enabled me to further clarify and explain some of the points highlighted by the teachers. As I have already outlined, these sources included professional conversations with experts in the field and documents that they recommended. Being an outsider to the research context, as predicted by Mathison (1988), I was assisted by this triangulation in forming a more "holistic understanding of specific situations and general background knowledge" about the specific research context in my study (p. 17).

Member-checking was also used to strengthen the process of validation. Mertens (1998) considers member-checks to be the most significant criterion for establishing credibility. Member checking is a process by which the interviewees verify the accuracy of the researcher's report (Boudah, 2011; Creswell, 2013; Franklin et al., 2009; Gall et al., 2005; Patton, 2004). After the interview and initial data analysis, I emailed the transcribed interview along with the initial interpretation to my participants with the pseudonyms Fred, Becky, Sue, and Amy, who had shown interest in reading their transcripts at the time of data collection. Not only did this provide these participants with the opportunity to review, alter, and comment on the transcripts, it also offered me an opportunity to make sure I had been successful in capturing the phenomena in a way that the participants would recognise. While there were some minor changes suggested by two participants correcting information about the software they were

using, and some further clarification about their school context, the remaining two were satisfied with the transcripts. The findings were also presented at the Community Languages and English for Speakers of Other Languages (CLESOL) 2014 and 2016 national conferences, which are held biennially in New Zealand. Two of the teachers whom I interviewed for the study attended my presentation in CLEASOL 2016, after which they affirmed the alignment of their views with the ones expressed in the presentation. They also updated me about changes since 2013 and confirmed the relevance of the findings to their contexts.

Cross-checking the codes and the findings or, as Denzin (1978) has termed it, "investigator triangulation" (p.291), was another method used for improving the reliability of this study. Cross-checking is concerned with achieving inter-rater reliability, also called inter-observer reliability. Inter-observer reliability measures consistency and agreement between more than one researcher to interpret and analyse the data. Cross-checking is based on the logic that "humans are subject to numerous judgment errors" (Franklin et al., 2009, p. 361). Hence, attending to such errors involves seeking the feedback of other disinterested people to evaluate the emergent findings and assess the observations, transcriptions, and interpretation methods utilised. To enhance the trustworthiness and authenticity of this study, I discussed the research steps, coding process, and emerging themes with my supervisors. A small sample of the data was coded by a postgraduate student who was familiar with qualitative research to check for the inter-rater reliability. In this study thematic coding was superseded by later more complex analyses that were cross-checked with at least one supervisor and often two. As noted earlier, I also checked the findings with some of the experts I interviewed and presented them with a draft of my work and sought their feedback. This allowed me to compare and contrast my participants' views with that of the experts. Interestingly, no dissonance between the experts'

accounts and those of the participants were found. Furthermore, as described earlier, I also cross-checked my findings at a national conferences, e.g., CLESOL.

Theoretical triangulation (Denzin, 1978), involving the use of multiple theories and hypotheses when interpreting the data, was utilised as another way of ensuring the trustworthiness of the results. This was accomplished by drawing on the four theories, namely Nations' pedagogical principles (2007), Puentedura's SAMR model (2013), Davis's (2018) concerns-based adoption model of four steps, and Davis's (2018) Arena framework. The use of the first two theories is described in Chapter Four, where the main focus is on ICT integration. The use of the others is described in Chapter Six. These theories added a further lens to the discussion and analysis of the findings of the phenomenon under study. It is worth mentioning that, while the delay between data collection and the completion of this thesis appears rather long, the delay adds protection against identification of participants and enabled a greater depth of analysis layered into findings chapters and discussion.

3.5. Ethical considerations

Any research dealing with human participants involves a number of ethical principles that need to be addressed and explored throughout the research process (Mutch, 2013). As Creswell (2013) has recommended, I was conscious of ethical issues at a number of times during the study: prior to conducting the study, at the beginning of the study, during data collection, in data analysis, in reporting the data, and in publishing the study. I complied with the University of Canterbury's research on ethical considerations at all stages of the research. The University of Canterbury requires all thesis students to be aware of and conform to Ethical Guidelines for the Conduct of Research (University of Canterbury, 2014). Therefore, to seek approval for conducting my study, I submitted a thorough description of the project, consisting of methods of data collection, information samples, and consent forms as well as possible interview

questions to the University of Canterbury's Educational Research Human Ethics Committee (ERHEC). Following the principles outlined by the ERHEC, the participants were supplied with an information sheet explaining the nature, purposes, and possible sharing of the results of the study (Appendix A), and I gained their approval before proceeding with the study. According to Chapelle (2003), it is fundamental that the researcher obtain the participants' permission for any kind of research study. Hence, all participants volunteered and signed a consent form (Appendix B), which outlined in detail what they were consenting to.

I adhered to the concepts of autonomy, beneficence, and justice as three main principles for ethical research (Orb, Eisenhauer, & Wynaden, 2001). In terms of the participants' autonomy, I respected the participants and their rights to be fully informed about the research topic and to decide freely about their participation in or withdrawal from the study. The concept of beneficence refers to avoiding situations in which there exist a conflict of interests, or the possibility of harm for the participants. This was achieved by respecting the participants' anonymity and the confidentiality of their data. To comply with such principles, I ensured the participants' involvement in this research was completely voluntary and emphasised their right to withdraw from the research at any stage. Furthermore, to secure the participants' anonymity and confidentiality, pseudonyms were used and any identifying information was eliminated in the presentation of the data. This measure was particularly significant, since it provided the participants with a risk-free environment in which they could express themselves freely without fear of later identification. It also assured them that the interview would not, under any circumstances, put them at a disadvantage or endanger their careers. All data amassed during the research were kept in a secure place and access to the data was exclusive to me and my supervisors.

While it would have been useful to have the consent of the schools as part of the ethical process, this would have been extremely complicated and impractical, mainly because the participants' contribution to the research could have been compromised by requesting the school permission. This is because being either the only or one of the very few ESOL teachers in the school, requesting permission from the school principals would have compromised the participants' anonymity.

However, the ethical considerations regarding the lack of permission from the school is mitigated to some extent by stringently protecting the anonymity of the schools and the teachers, and the delaying of presentation and publications, so that readers should assume that the situation has changed where practices were negative. Another measure taken was not to approach the schools for the participant recruitment but through an online professional development network, i.e., the ESOL online and snowball sampling. In addition, the data collection procedures were conducted mainly out of schools and out of school hours. The measures taken imply that I am not aiming at criticising the schools and the leadership, but by uncovering the complexity of the overlapping and interacting ecosystems, I am drawing attention to the need to provide adequate and coherent support for ESOL teachers and to appreciate the complexities of the context in which they work.

3.6. Conclusion and the way forward

This chapter discussed the research design of the study and the rationale for its use. This study aimed to explore the influences on secondary ESOL teachers' ICT practices in their professional life. To this end, generative qualitative research was selected as the research approach. Data was gathered from both primary and secondary data sources and through in-depth semi-structured and unstructured interviews with twenty-one teachers, seven experts in the field, and consulting selected official documents. The procedures undertaken for data

collection, inductive and deductive data analysis, analytical and theoretical frameworks used, and ethical considerations taken in the data analysis process have been described. The following chapters will present the findings of the study.

Chapter Four
Participants' Reported Pedagogical Uses of ICT in ESOL Classroom

4.1. Introduction

This chapter is the first of the three chapters that report the findings of this study. It answers the first research question concerning the ESOL teachers' ICT practices. It provides an overview of the self-reported uses of ICT by the twenty-one secondary ESOL teachers from around New Zealand at the time of data collection, and the pedagogical roles that ICT played in ESOL classroom.

It is important to note that this data is based on the teachers' self-reported practices, and that what teachers report regarding what they do may not always reflect their actual practice (Borg, 2015). Furthermore, this chapter does not intend to evaluate individual teachers' ICT practices. Rather, the aim is to describe ICT tools the ESOL teachers reported they were using, identify the pedagogical purposes for which they were used, and explore the level in which ICT was integrated. Nation's (2007) second language teaching pedagogical principles and Puentedura's (2013) SAMR frameworks (see Section 3.3) were adopted to guide the analysis of this data. Nation's (2007) principles are used to analyse the ESOL pedagogies in general, and how ICT tools could be integrated for ESOL pedagogy in particular. SAMR is used to interpret the stages of ICT integration and e-maturity of the reported ICT uses by the ESOL teachers.

4.2. ICT as an ESOL pedagogical tool based on Nation (2007)

This section describes the uses of ICT as a pedagogical tool in the ESOL teachers' professional lives, with a particular focus on how ICT tools contributed to ESOL classroom pedagogy. ICT is described as a pedagogical tool in this study when it addresses Nation's (2007) second language teaching pedagogical principles (see Table 2.1). As discussed earlier, these ten

principles are based the four specific strands identified by Nation (2007); i.e., meaning-focused input, meaning-focused output, language-focused learning, and fluency development to guide the teachers towards designing well-balanced language-learning classroom activities. It is important to note that although the principles are based on the four strands, these strands do not map neatly onto specific principles. This section is comprised of ten subsections each correspond with one of Nation's language learning pedagogical principles. In addition, each subsection includes some of Nation's practical suggestions for operationalising the principles, as well as representations of the principles in the ESOL teachers' reported ICT practices.

4.2.1. Principle 1: Provide and organise large amounts of comprehensible input through both listening and reading

This principle relates to the meaning-focused input strand. Activities such as "providing an extensive reading programme, reading to the learners, getting learners to give talks for their classmates to listen to, arranging spoken communication activities and interaction via the internet" are recommended for addressing this principle (Nation, 2007, p. 10).

The teachers reported the use of different ICT resources such as audio files, multimedia, PowerPoint slides, and the web, to provide comprehensible input for their students. These were reported by the teachers as helping both them and their students to access content faster, more conveniently, and more efficiently compared to other sources such as books and journals. Nora and Fred believed that through the active engagement afforded by interactive online staged reading software such as Raz-Kids they were able to provide meaning-focused input for their ELLs and enhance their students' reading skills. This reading software provided extensive in-class and out-of-class reading practice, as the ELLs gradually worked their way from one reading level to another. Teachers reported that some features of this reading program, such as its user-friendliness, the diversity of activities it offered, and its adaptability to students'

language level made it a very efficient and convenient tool. For example, it allowed the ELLs to select a story for their reading comprehension practice which matched both their interests and their language level. The students can then decide on whether they want to listen to their selected piece being read to them by the program or if they want to read to Raz-Kids and record their own voices, so that they can monitor their own reading fluency and pronunciation. The students can further improve their reading comprehension through the quizzes and tasks that Raz-Kids produces based on students' selected reading texts. Fred, appreciated the suitability of the tool for a range of language levels. Based on their English language ability, his students could "choose books from the very most basic with only about three words per page to quite advanced booklets where the word level [was] quite a lot more advanced".

Being current and easily accessible made the use of online resources a popular practice for many of the teachers. For instance, teachers (including Nan, Becky, Sue and Kali) reported that they used online news, both in the simplified format and the authentic format, as an easy way to expose their students to English language input and add diversity to their classroom materials and their pedagogy. In addition, by taking "a snippet of advertisements" or using "a film", Sue was able to provide her students with further language input using authentic materials, i.e., those developed for purposes other than language learning.

In addition to online sites, the teachers reported that ELLs also gained extensive benefits from PowerPoint presentations and storytelling tools. These tools facilitated the students' own preparation and presentation process, and also made them more comprehensible and engaging for their classmates. For instance, while one student was engaged in a meaning-focused output activity when presenting a work via PowerPoint, other students were engaged in meaning-focused input, as the audience of the presentation. This type of activity is in line with one of Nation's (2007) suggested activities, i.e., "getting learners to give talks for their classmates to

listen to" (p.10). This is based on the logic that "one person's output can be another person's input" (Nation, 2007, p. 3). Heather reported that she would sometimes ask her students to make a PowerPoint presentation and present it to their classmates. Linda encouraged the use of such tools with her students, as she found it convenient for her students, and felt it also made the learning process more engaging and fun for them:

> When it comes to things like presenting information, a lot of them prefer to do it using an ICT tool, rather than making a poster or something like that, or a pamphlet. One reason is that they can do it a lot quicker.

4.2.2. Principle 2: Boost learning through comprehensible input by adding a deliberate element

This relates to both the meaning-focused input and the language-focused learning strands. For this principle, Nation (2007) suggests activities such as noting words on the board, consciousness raising, and problem-solving activities before, during, or after the activity. The classroom board was reported by the teachers to be used quite often to help with illustration and elaboration of new concepts and structures. Jean and Sandra reported that some tools, such as a digital camera, had become a very practical means of keeping a record of the material on the board for later access and retrieval, and saving classroom time.

Nora explained that online resources assisted her in boosting her students' learning by providing opportunities through which new concepts could be visualised as they appear. As she explained: "The pictures and images can help them in understanding the words easier". Sue confirmed Nora's words and explained that she also used tools such as online resources as they both enhanced her students' understanding of new concepts and made teaching easier for her: "It is much easier to just flick on a visual image than to actually try and explain or look something up in a book". Similarly, Rebecca reported the convenience of online resources for,

presenting novel concepts and raising their understanding of the concept as they arose in the context of communication activities:

> The other day, I was talking about daffodils, then, I have students looking at me: "What are daffodils?" So, I just went on the computer, got into Google images, got pictures of daffodils and showed them … If I need to reference anything, I just go on the internet and show it to them. It's a very useful tool.

4.2.3. Principle 3: Support and push learners to produce spoken and written output in a variety of appropriate genres

This principle addresses the meaning-focused output and the fluency development strands. The type of activities Nation (2007) suggests for addressing this principle include the use of communication activities such as role plays, writing and speaking tasks appropriate to the language learners' needs. Some of the ESOL teachers addressed this principle when they asked their students to prepare a talk or draft different genres of writing, from weekly and daily reports to summaries of their readings. Writing appeared to be a major part of tasks that the teachers required of students who were planning to go and study at higher levels and were preparing for the national exams such as NCEA. An ICT element was present in many instances, for instance writing assignments were sometimes done in a word processed format.

The teachers also reported that they made use of tools such as Timetoast, VoiceThread, and Photo Story to encourage their students to produce meaning-focused output, since they were free, user-friendly, stimulating, and engaging. As explained in Principle 4.2.1, the PowerPoint presentation tools also supported students in their speaking performance.

Linda used Timetoast to engage and encourage her students for "biography and recount writing". A recount in an ESOL classroom refers to the retelling or writing up of a personal experience, event, or daily news by the ELLs. Some other teachers also reported their students' use of such software to generate stories, comment on each other's stories, and listen to their

own voices. Sue explained how some ICT tools enabled her students to create digital stories with the photos they took on their digital devices: “They combine pictures and sounds…then they write a script and then they will do a kind of a short digital story of their lives with VoiceThread”. Nora had also been using “a lot of VoiceThread” for almost six years, reporting that use of this program helped to address her students’ needs with their “speaking, grammar, and pronunciation”.

4.2.4. Principle 4: Provide opportunities for cooperative interaction.

This principle addresses fluency development as well as meaningful input and meaningful output. To operationalise this principle, Nation (2007) emphasises collaboration and teamwork amongst learners through collaborative reading and writing, and engagement in opinion and information gap activities. The findings of this study indicate that ICT tools could facilitate collaboration and cooperative interaction amongst ELLs. Instances of the use of brainstorming tools, Google Docs, Microsoft Word and online forums as tools for improving students’ writing and promoting collaboration and communication were reported by some of the teachers interviewed.

Linda used SpiderScribe to provide her students with a “collaborative learning and sharing environment” where they worked collaboratively in groups and brainstormed their ideas to fulfil a writing task. Kali used presentation software such as PowerPoint, in order to motivate her students and increase the cooperation and communication amongst them. Similarly, Sandra made use of PowerPoint presentation or story-telling tools to create an interactive learning environment whereby her students were asked to share their work online so that it could be “critiqued and peer-reviewed by their classmates.”

4.2.5. Principle 5: Help learners deliberately learn language items and patterns, including sounds, spelling, vocabulary, multiword units, grammar, and discourse

This principle concerns the language-focused learning strand. Activities recommended by Nation (2007) include deliberate teaching of language items, giving feedback on students' writing, arranging individual study of language items, and doing teacher-led intensive reading.

In this study, a considerable amount of the ESOL teachers' time appeared to be allocated to this pedagogical principle. This can be inferred from the interviewed teachers' frequent reference to the time they spent on activities, which enhance students' vocabulary development, help with learning of grammar, and improve writing proficiency. This principle appear to be specifically important for the ESOL teachers, since a key responsibility for language teachers in content-based instructional approaches is to support language learners with their language-focused needs (see Section 2.5.2.2).

ICT was perceived as helpful to support the teachers in addressing their students' language-focused learning needs. For instance, Claire used a voice recorder as a simple vocabulary learning tool, particularly when she couldn't find something that fulfilled her needs on the market. She created her own teacher-modified vocabulary listening activity through recording herself reading the first and second thousand most frequent used words in English language (Nation, 1997) for her lower level students. Claire believed that the recording not only enabled the students to listen to the new vocabulary multiple times, but it also helped them to learn the correct pronunciation. Becky similarly reported her use of digital dictionaries to enhance her students' understanding and learning of new vocabulary. She explained that in order to focus her students' attention on a language item, she would ask her learners to look up a word in a dictionary and then put it in their language for better understanding and learning of the new vocabulary. However, despite the benefits of digital dictionaries some teachers, including Nora

and Becky, were concerned about students' overuse of, and attachment to this type of tool. This concern was heightened by the national assessment rules and rubrics. This issue will be discussed in more detail in Chapter Five, Section 5.5.3.

Some ICT tools were reported as being particularly helpful when dealing with a range of students coming from different English language levels, learning different subject areas, and dealing with different vocabulary lists. Software such as Quizlet was reported to provide some of the teachers and their students with opportunities to develop their own personalised wordlists. It also offered collaborative learning opportunities through which students and teachers can build different vocabulary lists related to the different subject areas they needed to cover. For instance, in collaboration with other teachers, Nora used a vocabulary building tool to develop a comprehensive list of "special word lists that kids struggle with" in almost every subject:

> We add all our own wordlists, so we have probably got nearly 2000 words in there under my name and my other teachers' names. And we covered things like the year seven and eight subjects; we have got math words, we have got all the basic English words, and we also do like year nine human rights, religions, volcanoes, disasters; all kinds of special word lists that kids struggle with.

Quizlet and Spelling City were two vocabulary-building tools reported to be used by some teachers to expand students' vocabulary knowledge. Such software provided opportunities for language-focused activities. Students reportedly used these cloud-based tools to build their individual vocabulary list and/or collaborate with their classmates to build up a class repertoire of new vocabulary. The initial process of developing the word lists and subsequent learning of them constitute a deliberate focus on and learning of new language items. Fred felt that students could probably learn the words with Quizlet much better than with any other technique due to the tool's provision of what he saw as unique learning opportunities:

> Quizlet is a method of learning words online and we have a class set of words and then students have their own individual word list. And it enables them to enter words and practise the words in a variety of ways using different modalities [flashcards, quizzes, mix and match].

The teachers believed that games and activities generated by such tools made the learning more directed, personalised, adjustable to different learning styles, and fun. This is because the content of the games generated by the software was based on word lists provided by the users. Acknowledging the diverse and engaging activities generated by such software, Nora explained: "There are all kinds of different activities that they can do. There are really fun spelling games, and then there are things like match the meanings, match the word to the sentence, cloze exercises".

Nan similarly reported her use of VoiceThread to facilitate her students' learning of grammar and language items. She gave this example:

> My latest [activity] with my low-level kids is looking at the present continuous tense and they have to tell me what time it is and what these people are doing in their house at that time. They record their voice so they can listen to it later.

Some automated writing evaluation (AWE) systems with artificial intelligent ability, such as Microsoft Word's editor features, were reported as being beneficial for ELLs in helping them deliberately learn language items and patterns. Such tools assisted students with identifying language-focused problems such as word choice, spelling, sentence structure, use of the passive voice, and punctuation. These tools enabled the teachers to give their attention to more complex language issues, which were not detected by such software.

ICT tools were also seen as a way of eliminating problems created by illegible handwriting, as they made it easier for the teachers to read students' assignments, and for the students to read their teachers' feedback. Microsoft Word, for example, made it easier for the students to read

and understand teachers' tracked changes, comments, and feedback on their work. Becky explained:

> Some students send me work. It's nice to do it on the laptop as well, because I can add comments and show them changes and they can read it easily. They don't have to read my handwriting.

However, pedagogical concerns were raised by some of the ESOL teachers in relation to some of the ICT tools. For example, Nora, Kali, and Jean indicated that word-processing tools may interfere with teacher-student interaction, language learning development, and the development of hand-writing skills. Jean stated that she had rejected the use of Google Docs because she felt it blocked some of the face-to-face features which she regarded as important when interacting with her students:

> With beginner [students] I really need to be with them. And so if they are typing on Google Docs and I am trying to correct it at the same time at my desk, looking at the computer actually doesn't work for me, because I need to interact. I do a lot of body language. So that didn't work [...] I want to see what mistakes they make.

Some teachers also had concerns that the use of Microsoft Word could interfere with students' handwriting development and their attention to spelling. Jean, for instance, asked all her students to do their writing first by hand, as she explained: "I still firmly believe that actually writing it by hand does something to your brain". She felt this was particularly important because the students' national examinations that were pen-and-paper-based (see Chapter Six for further discussion of this). Margaret attempted to alleviate some of the concerns mentioned above through strategic use of the ICT tools, i.e., blending an ICT-free and ICT-assisted approach. In other words, she would first ask her students to hand write their story in class, then have them word-process it in the computer lab and send it to her via email. Margaret then edited the students' work and provided feedback using the track changes option in the word

processing programme. She reported that it was then the students' responsibility to read the feedback and decide whether they wanted to accept or reject the changes she had suggested. They were also able to get support from their teacher and their classmates with this before providing their final draft to their teacher in a printed format.

4.2.6. Principle 6: Train learners in strategies that will contribute to language learning

This principle mainly concerns the language-focused learning strand, and also contributes to developing language learners' autonomy. Some of the strategies Nation suggests for this principle include learners practising to guess from the context, use dictionaries, analyse word parts, and use flash cards for learning. The interviewed ESOL teachers reported their use of digital dictionaries and various online tools such as Quizlet, E-vocabulary, and ManyThings.org with their students. These tools had features such as learning using flash cards and constructing personalised word lists to promote English language acquisition. These tools were integrated in ESOL classrooms to help students develop independent learning and gain knowledge and skills related to using ICT for English language learning purposes.

Digital dictionaries were considered an important tool for ESOL classrooms and their use was reported the most by the teachers for developing students' knowledge and understanding of a new vocabulary. In addition to helping the students gain autonomy, teachers believed that bilingual and monolingual digital dictionaries also enabled the students to solve their lexical problems quickly. This was important, to the extent that in some schools, including Sandra's, having some kind of a digital dictionary and translation device was compulsory for ELLs. Nora reported digital dictionaries as being one of the most significant contributions of ICT to an ESOL classroom due to the "translating" feature they offer. She emphasised the necessity of such applications in the classroom as something "non-negotiable" since they "made life brilliant" both for the teacher and the students. She further argued that electronic dictionaries

reduced the teachers' and their students' distraction time by providing immediate and easy access to meaning.

Similarly, the internet was reported as being of benefit to students. The teachers believed that by using online resources, students could develop some of the strategies and skills required for independent learning. For instance, they could guess different words from the context and then improve their comprehension of a topic by reading it in their own language. Nora explained: "It's great for their understanding and they can research in their own language and understand it."

4.2.7. Principle 7: Provide fluency development activities in each of the four skills of listening, speaking, reading, and writing

As it is clearly stated in the above statement, this principle concerns the fluency development strand. For this principle, Nation (2007) recommends that teachers "run a speed reading course, include repeated reading, provide an extensive reading programme, do 4/3/2 activities, organise a regular ten-minute writing programme and do listening to stories" (p. 11). Some of the activities suggested for attending to the fluency development strand in this principle are very similar to activities suggested for the principles that focus on meaning-focused input and meaning-focused output strands (e.g., providing an extensive reading program). Hence, while doing some extensive reading and writing using digital or non-digital tools may be assigned by some teachers as homework to develop ELLs' fluency, it can also be recognised as a meaning-focused input or output.

Due to the limitations of this study, the purpose behind some of the ESOL teachers' reported activities with ICT is not always fully clear. For understanding the purpose of the task requires both insight into the content of the tasks designed, as well as an evaluation of the alignment of

the characteristics of the content/text with the criteria that Nation (2007) has recognised for fluency development activities.

Based on the teachers' reports, it appears that the major focus for many of the ESOL teachers' ICT practices was on the language-focused learning and meaning-focused input and output strands rather than fluency development. This is mainly because of the limitations of the ICT tools and the characteristics associated with the context of the study, which is a second-language content-based context. In second-language content-based learning environments, language learners have many opportunities to develop their English language fluency outside the ESOL classroom, as they interact with the specific subject-related content, their subject-matter teacher, classmates, homestay parents, and in society. This is evident in the homework Melanie assigned to her students. For instance, while Melanie asked her students to "write a diary every day" to develop the students' fluency, she also requested that they "speak and have conversations with their classmates and their homestay parents every day". Kali used Google Docs to develop her students' fluency and enhance collaboration and communication between her students after school hours. Also, online forums were used to provide opportunities for constructive discussions between students. Claire explained:

> Every night, they got to choose something according to their level. Read it, listen to it, and comment on it on the [Moodle] forum. And then comment on someone else's and someone comments on theirs. It's just a way of me being able to know that they are doing their homework and interacting with the English language outside the classroom.

4.2.8. Principle 8: Provide a roughly equal balance of the four strands of meaning-focused input, meaning-focused output, language-focused learning, and fluency development

This principle concerns balancing the four strands, which requires teachers to keep a record of their classroom activities, the time spent on each activity, and the strand that the activity links

to. However, attending to this principle may not be as straightforward as it may initially seem. This is mainly because the situation may vary for ESOL teachers compared to other language learning courses. For instance, in a typical language learning course, the language teacher is usually solely responsible for the language learning process and covering the four strands. However, in content-based instruction, the ESOL teacher needs to work in collaboration with other subject teachers. Consequently, in order for the ESOL teachers to be able to keep a full record of coverage of the four strands, extremely close collaboration and communication would be required between them and other subject teachers. Although ICT can facilitate this type of collaboration between teachers, no reference to communication through ICT with this particular purpose was reported in this study.

4.2.9. Principle 9: Plan for the repeated coverage of the most useful language items

This principle mainly focuses on language-focused learning strand and concerns the retrieval and repetition of language items. Some of the suggestions Nation (2007) provides for this principle include "focus on high frequency items, use controlled and simplified material and provide plenty of input at the same level". It can be argued that this principle may be covered, in part, without ESOL teachers' deliberate engagement, since students are likely to encounter the most frequent language items quite naturally outside their ESOL classrooms.

In addition, the use of some of the digital tools presented above can further support the implementation of this principle, both inside and outside the classroom time. For instance, tools such as Quizlet (See Principle 5) empowered the teachers to plan for repeated coverage and rehearsal of the repertoire of various vocabulary lists developed earlier by the teachers or students. Nora, for instance, reported the use of a website and its diverse capabilities for repetition and retrieval of various language items at home. She also talked about the use of a website that created different activities with the vocabulary list that had been uploaded onto it:

> The website generates a list, an example sentence and then the website games and activities from the word lists. So there are four or five different spelling games. They are really fun spelling games, and then there are things like match the word to the sentence, match the meanings, cloze exercises. They are all kind of different activities that they can do. And they can write them into sentences, write them into paragraphs, and that is also the kind of thing they do at home for the students.

4.2.10. Principle 10: Use analysis, monitoring, and assessment to help address learners' language and communication needs

Nation has not provided any specific suggestions for enacting this principle. However, the ESOL teachers' uses of some ICT tools can contribute to this principle, including some features of learning management systems and some applications that have student monitoring features. Fred and Nora managed and monitored their students' progress through such programs, and they also extended their students' learning outside classroom hours via these tools. Fred explained that through digital programs, he "can get [the students] learning for another hour or two at night and still stay connected with them and monitor their learning."

This type of facility was reported to be useful, convenient, and efficient in enabling teachers to monitor and observe their students' learning progress, their engagement with the learning content, and diagnosing those areas where they needed help. Fred valued Raz-Kids over the earlier CD audio-books he used because it offered an immediate monitoring facility. Through the Raz-Kids dashboard, he could "monitor [his students] by seeing which books they [were] reading, how they did in the quizzes and then go over and help them individually where they [were] having problems". Nora explained that she would track her students' progress through the reports an American website sent her:

> I get a weekly update from them. They email me who has been doing their homework, what they have done, and how they have got there and all that kind of stuff. So I can keep track of them very easily.

However, some of the interviewed teachers pointed out that although ICT help teachers identify students' learning progress and their learning problems, it can also impede this process if not approached cautiously. For example, although the students benefitted from the auto-correcting options in some of the ICT tools, teachers sometimes perceived this as a potential liability rather than necessarily an advantage, because it made it difficult for the teachers to identify individual student learning challenges. Jean explained: "All my [students'] writing I do first by hand because I feel that is also important. And also then it can be corrected. I want to see what mistakes they make." Sandra was also cautious about the students' use of software with auto-correcting facilities. She explained:

> With the technology, as teachers, if [students] use Microsoft Word, we don't always know where their mistakes are, because of Word's grammar checks and spell checks. So, what I would quite often do is my students have to hand write everything first and then we look at typing it because if it's handwritten, I could see their mistake and help the individual student with spelling or grammar or whatever they need.

4.2.11. Summary of ICT as a pedagogical tool based on Nation (2007)

Guided by Nation's second language learning pedagogical principles, this section presented the ESOL teachers' reported uses of ICT and some of the pedagogical purposes ICT fulfilled as a pedagogical tool in these contexts. It can be concluded that ICT could offer support to ESOL classroom pedagogy and the enactment of the four strands in Nation's (2007) model. However, it appears that ESOL teachers' teaching priorities, their relations with their colleagues in the school, as well as their roles and responsibilities in a content-based second-language learning educational context varies from other language learning contexts. For instance, as explained in Section 4.2.8, collaboration with teachers beyond the ESOL classroom

context is required in order to fulfil principle 8, i.e., monitor and balance coverage of the four strands in a content-based context.

The dynamics and interactive features of ICT tools enabled the participating ESOL teachers in the study to monitor their students, track individual students' progress, and diversify their teaching techniques and pedagogy. ICT also permitted different learning strategies, personalised learning activities, and collaborative and independent learning opportunities for the students. Students engaged with ICT tools individually (i.e., learning independent of other students) or collaboratively (i.e., on a common task with other students). However, exploration of the correspondence between the teachers' ICT practices and Nation's pedagogical principles would require longitudinal observation and in-depth analysis of the teaching content, which is beyond the scope of this study. Also, because one tool may have different functions and may address a number of pedagogical principles, depending on a teacher's purpose in using a particular ICT tool as well as the kind of the content presented by the tool (e.g., whether it is new versus old vocabulary), it can be challenging to categorise particular tools and instances of use according to each of the ten principles.

It is also important to note that the majority of the ICT tools reported to be used by the ESOL teachers in this study were not specifically designed for English language teaching and learning purposes. Hence, some of them needed specific adjustments and input from their users, and the ESOL teachers usually had to adjust the tools and develop content to match their teaching objectives. This may be due, in part, to the limited number of suitable and relevant ready-made materials for this group of learners. Consequently, integrating ICT in an ESOL course requires the teachers to have both the necessary technology skills and the time to prepare and use the features within such programmes.

With regards to the integration of ICT tools for pedagogical purposes, it is important to acknowledge that the teachers varied in the tools they used, the purposes for which they used each tool, and their frequency of use. Furthermore, it was clear that the perceived relevance, efficiency, and convenience of ICT tools had an influence on the teachers' selection and use of them. Not all of the teachers used the same ICT tools to address the pedagogical principles, and where they did, the frequency of their use and its level of integration varied. For instance, amongst the 21 ESOL teachers, Fred and Nora were the only teachers who reported active use of ICT for monitoring and tracking their students' progress. One possible cause is that it takes time for the teachers to mature in their ICT practices. The literature reviewed earlier indicated that the uptake of ICT varies over time and tends to be a staged process (Davis, 2019). The following section explains this in terms of the reported use of ICT by these teachers in relation to the SAMR framework (Puentedura, 2013), which is the most common e-maturity framework used in New Zealand.

4.3. Level of integration using SAMR

As explained in the previous chapter, the SAMR model is composed of two levels of ICT integration and four stages. The enhancement level encompasses the two lower stages of ICT integration, i.e., substitution and augmentation, while in the higher level transformation is evident when the use of ICT enters the modification and redefinition stage. In other words, at this level, learning is not only enhanced with ICT and also transformed. Applying SAMR to the teachers' reported uses of some ICT tools, it was identified that ICT was sometimes used to substitute for an old practice without any functional change. For instance, to support and encourage learners spoken output (Principle 3) or help learners to deliberately learn language items (Principle 5), Donna set some speaking tasks for her students by simply using iPads to record her students' voices and video as a substitute for a voice recorder and camera. She

explained: “I use iPads to record my students’ reading, and their oral work [...] and the other day I was using its camera to film”.

The use of some software and online services such as PowerPoint as a presentation tool, digital dictionaries, and Google searches were mainly limited to the augmentation stage since the kind of practices with such tools did not transform learning, but did enhance learning opportunities. For example, the students’ use of online audio files provided a larger amount of comprehensible input with more variety compared to the older recorded files on tapes, CDs, and DVDs. In addition, PowerPoint presentation tools were reported to bring diversity to a teacher’s teaching practices and boosted opportunities for students’ learning (Principle 2) by allowing diversity through the dynamic presentation features the tools afforded.

The use of digital dictionaries, as opposed to their paper-based equivalent, can be recognised as enhancement. Built-in facilities, such as the pronunciation component in digital dictionaries, are instances of the use of ICT in the augmentation stage, as they help the learners to better focus on the language items. The use of word processing tools, such as Microsoft Word, were also instances of the use of ICT at the augmentation stage, in which features such as spell check, grammar check, thesaurus and word count features could support students in written output and help them to learn language items during their writing tasks. The reported use of online services such as information resources, the use of hyperlinks and various other learning tools fluctuated between the substitution and augmentation stages. For instance, the students’ use of online information and websites to seek information without making any contribution to this environment, (e.g., having their own blog or actively participating in online forums) was an example of the use of this medium at the substitution stage. The use of hyperlinks added functional improvements upgrading it into the augmentation stage.

While the majority of the ICT-using teachers' practices appear to be at the augmentation stage, there were some teachers, including Claire, Fred, Sue, and Nora, who moved at a faster pace towards the transformation level. Based on SAMR, transformation in learning happens at the modification and redefinition stages. The infusion of ICT at this level allows for substantial changes in the format of the lessons and redesign of the activities. VoiceThread, Quizlet, Spelling City, SpiderScribe, and Raz-Kids, and some features of learning management systems transformed learning by offering opportunities previously almost impossible in learning. The activities and analytics Raz-Kids provided, such as comprehensive input (Principle 1), fluency development activities (Principle 7), and the monitoring and assessment feature (Principle 10) were examples of such transformation of teaching and learning. The readings in Raz-Kids are designed in a way that allows for individualised student learning, in that the materials can be adapted based on students' English language level and their learning pace. Another positive feature that transformed learning opportunities was the provision of immediate feedback at the time of assessment. Another important feature of such tools is that it provided teachers with monitoring and tracking options. Claire, Fred, Sue and Nora were the teachers who upgraded the use of the learning management systems to the modification stage by using it for collaborative engagement between their students and/or monitoring and tracking their students' progress.

Redefinition is the highest stage of ICT integration in the SAMR model. At this stage ICT becomes an indispensable part of the process. Sharing, collaborating, communicating, and interacting with other students or people in the school, both nationwide and worldwide can be some possible activities for this stage. A possible example of redefinition in an ESOL classroom would be if students created their own blogs and tried connecting to a wider audience. Another example would be if students connected to other students within or outside

their schools to develop a comprehensive selection of ESOL materials based on their needs. This would not only provide the students with more specialised and relevant online material, it would also help the teachers to recognise students' needs and develop teaching material accordingly. However, the findings indicated that the use of ICT tools by the participating teachers rarely surpassed the modification stage. In this study it is possible that Fred may have included such activities in the resource based learning approach in his ESOL classroom that he reported, so he could have reached the most mature stage of ICT use in the SAMR model.

In examining the teachers' reported practices with ICT tools in light of SAMR, in line with Hamilton et al.'s (2016) argument (see Section 3.3), it became clear that there are weaknesses in the framework and it would be naïve to try to judge the reported practices as belonging to a single SAMR stage. Firstly, similar to many other e-maturity models, SAMR is quite techno-centric (Davis, 2018) and ignores the context, the teaching and learning aims, the objectives, and the nature of the students themselves. Further, it does not take account of the affordances of the ICT tool itself; some ICT tools used by the ESOL teachers, such as digital dictionaries, did not appear to have the capacity to provide more than the augmentation stage of SAMR. In addition, the ICT tools keep evolving and the teachers' practices with ICT must co-evolve with those changes.

The staged layout in SAMR was particularly problematic because SAMR frames the redefinition stage as the ultimate goal of ICT integration and ignores the diversity and unique features of each context. There are contexts and occasions, such as in ESOL classrooms, where the use of ICT may not be beneficial and may impede the process and pace of the class. For example, some of the teachers in this study reported that due to some of the students' specific circumstances, such as a low language level, lack of ICT skills, and pastoral needs, their teaching practices had evolved to suit their own specific context(s). Thus, while a teacher such

as Amy was capable of transforming ESOL pedagogy with ICT, at times she choose not to do this, in favour of resources and teaching strategies that she perceives as more appropriate for her learners and context. Amy was a mature user who used ICT tools with her Japanese students, but made a professional decision not to use ICT with her ESOL students. This example highlights a weakness of SAMR and its techno-centric approach. This is because Amy could be inaccurately classified as having a low level of ICT maturity in her ESOL classroom based on SAMR, despite her report that she had adopted relevant ICT uses in her foreign language classroom and she also supported other teachers to use ICT for language learning.

Given such critique, any techno-centric framework is limited in framing the evaluation of ICT integration by ESOL teachers in this study. Nevertheless, such maturity models offer researchers and practitioners a lens that can usefully inform a tentative framing in order to appreciate the staged development of teachers' levels of ICT integration, and can also provide insights to help with both problematising and taking action to promote higher levels of ICT use where appropriate for the contexts.

4.4. Conclusion and the way forward

This chapter provided an overview of ICT practices of selected secondary ESOL teachers' classroom practice. Using Nation's (2007) pedagogical principles, it was concluded that ICT tools could be considered beneficial in the ESOL contexts. ICT supported teachers in their pedagogy by facilitating knowledge and skill development, and providing opportunities for students to engage in language learning activities in a more dynamic, diverse, and collaborative way. The teachers reported their use of ICT tools that brought convenience and efficiency to the task in hand and were compatible with the needs of their students. However, despite the benefits, not all of the ICT tools were used by all the teachers. Uses varied in the type of the tools used and the purposes for which they were used. Furthermore, using SAMR, it was found

that the ESOL teachers' e-maturity level of ICT integration appeared to be varied. However, caution was needed in the use of any e-maturity model such as SAMR due to the limitations of any techno-centric view.

Such a wide diversity in teachers' reported ICT practices led to a closer look at the teachers themselves to investigate possible causes. The next chapter focuses on factors that were reported by the teachers to potentially influence their ICT practices.

Chapter Five
Reported Views on a Range of Factors that Appear to Influence ESOL Teachers' ICT Use

5.1. Introduction

Previous chapter focused on the teachers' self-reported ICT practices, and its pedagogical role in an ESOL classroom. An unexpectedly wide diversity both in teachers' ICT practices, frequency of use, and level of integration was found. Findings suggested that the pedagogical affordances of ICT alone could not contribute to such diversity, and other factors were involved and an explanation behind the identified diversity was sought. Further analysis of the data with the aim of addressing the second research question, led to the identification of a range of factors that the participants reported to influence their ICT practices. These findings emerged from the analysis of in-depth interviews with all the twenty-one ESOL teachers. Where relevant, these findings were triangulated with secondary sources of data, such as reports from the MOE and experts' opinions. These influences were organised under four main themes, and concern teachers' ICT competence and willingness to change, the learning opportunities available to them, their students' characteristics and needs, and the existed policies and their school culture. Borg's (2015) model of teacher cognition is used to present these themes.

5.2. Teacher ICT competence and willingness to change

This section presents data on teachers' view on some personal teacher characteristics that affect their cognition and the use of ICT tools. These characteristics are presented under four subthemes. One of the most important influences of this kind appeared to be the teachers' willingness to and enthusiasm towards change. Lack of technological competence, slow pace

of learning and remembering new ICT practices, and the teachers' fear of potential loss of face were other reported influences that appeared to hold the teachers back from ICT use.

5.2.1. Willingness to change

The participants' willingness to change was reported as one of the most common themes to have an influence on the teachers' inclination towards change with ICT. Many teachers, including Becky, Jean, Amy, Kali, Fred and Claire reported that they were lifelong learners and enthusiastic about ICT, which appeared to have had considerable impact on their inclination towards learning and ICT adoption. Having flexibility, adaptability and patience was seen as crucial for moving towards change. For example, Becky was in her "late 60s" and "still feeling enthusiastic for this form of teaching". Although she believed that she had "to work hard at [her] IT skills", she was "not prepared to say: 'no, I can never do it". Willing to be a lifelong learner, Claire was also open to new challenges and adapted her teaching to include ICT:

> In myself, I didn't want the technology to be an excuse for me to give up teaching. I said 'No, I can do this'. It's a good challenge and it's also to connect with my students' world. It's the world they are in, Facebook and Twitter. I want to keep current with technology and computers regardless of my age.

Teachers' willingness to change involved the teachers being ready to change their mind set and alter some of their previous pedagogical habits. However, this was not easy for teachers such as Joseph who reported that the use of ICT was not initially part of his mindset and they became familiar with ICT "relatively late in life". Jean recognised that "it takes a while to change an old habit, even though it [ICT] looks exciting". Such a change appeared to be even more difficult particularly when teachers perceive their pedagogy as successful. Amy argued:

> For many teachers that have taught for a very long time before the big technology revolution of the last few years, they have had very good systems that have worked that haven't required the big use of technology.

It's worth mentioning that the recognition of the need to alter or discard ones pedagogical approach was not just limited to more experienced teachers. Linda, a teacher in her 30s showed reluctance towards ICT use since she perceived her current as successful and doesn't see any need for changing her pedagogy: "You just get into patterns … where things are working so why change [that]". Such behaviour may stem from her schooling and how much ICT was integrated in her education when she was a student. This will be explained in more detail in Section 5.3. Although willingness to change appeared to be very important, there are other influences which may discourage or hinder teacher willingness to change and their ICT practices. The lack of technological competence and confidence was reported to be one of these influences which will be explained next.

5.2.2. Lack of technological competence

Some teachers were anxious about potential unexpected technical glitches during their ICT use and the fear that their actions might cause serious damage to the system. Heather, for example, was cautious in her use mainly because she was "a bit scared of technology". Heather described her feelings when she confronted a technological glitch in a classroom, saying that: "Sometimes I feel a bit panic-stricken, almost like you freeze, like 'oh, I can't cope with that', you know, immense frustration". As for Nora, she was anxious that while she was using her computer, she might inadvertently delete some important data: "… I am a little bit more cautious, I might wipe something or delete it". In a similar fashion, Mary, comparing herself with "the young" who in her view "fearlessly use ICT", remarked upon her "innate fear" since she perceived ICT tools "as complicated". However, such anxiety was not true for all the older

teachers and, even if it existed, it did not hold them back. This was implied in Fred's behaviour as he explained he would not panic, but would give some time to himself to solve a problem: "If I can't find an answer, I will leave it for a little time and come back to it later". It is worth mentioning that such anxiety was not reported by younger teachers as they believed they had the basics and could overcome problems. For instance, Sophie did not consider herself as ICT savvy, being more inclined toward "literature and theatre". Nevertheless, as was the case with Jamie, Nick, and Sandra, she believed that if there was a need to work with something digital she could "figure it out" either through experimenting with the tool or reading the instructions since she knew "the basics". Such diversity between the teachers in their feelings towards ICT indicates a need for a deeper analysis of teachers' behaviours, feelings and fears towards ICT integration. Some of the teachers' slow pace of learning and their forgetfulness appeared to influence teachers' ICT practices.

5.2.3. Slow pace of learning new practices and remembering

One of the influences that appeared to inhibit some of the teachers' in their path towards change with ICT was their slow pace of learning and fast forgetting. Most of the older teachers considered themselves as 'slow paced', perceiving learning as a slow process especially when they compared themselves with their faster paced younger colleagues, who grew up with technology being part of their lives. For example, Melanie commented that "the older you get, the more difficult it is to learn a new skill". Heather also felt uncomfortable with her learning pace: "I feel a bit stupid with ICT because I can't pick it up fast enough". Barbara, who was in her late sixties also raised the same concern: "It takes longer for me to learn it… and you do need more support".

Not only did some teachers report that it took them more time to learn, but they were also weary of the fact that even if they learn something, they forgot it quite fast. Ann stated that "I am

going to be 62 in July, so I learn and then I forget, but I know I have to be patient and try again". Jean appeared to share the same concern when she reported that "unless I use it [a particular ICT tool she had learnt] all the time, I forget". Similarly Kali, emphasised their need "to keep on doing it otherwise, [they] forget how". Acknowledging the harder path and slower pace, Becky emphasised the need for patience, a positive attitude, perseverance and a strong desire for learning: "a lot of it really is just your attitude, you decide, you get frustrated, and you know you don't remember things as much as the young ones do. But if you really desire to know it, you can, but it takes longer". However, having such perseverance may be easier said than done particularly if teachers do not feel that they are being supported by their colleagues and there is a potential loss of face for them.

5.2.4. The potential loss of face

The fear of loss of face appeared to be the by-product of their perceived slower pace of learning which had made some of the teachers reluctant towards change. The slower pace of learning appeared to have created diffidence and fear of being judged and ridiculed for many older teachers. Becky referred to her constant "frustration" about how she would be "judged" especially when she needed to approach technology-savvy people for help: "You need people. I do find this is one of the frustrations for me. When I ask a question, and I had this *oh* [from them], I think [with myself] just tell me once again. Don't sort of judge me". Melanie became very cautious about who she approached for help. She would "only go and ask the technician or the teachers who were very patient and friendly in showing [her] what to do" because of the unpleasant experience she had had with one of the teachers she approached for help:

> There was a teacher who was very impatient, who was very intolerant, and after asking her once, I never did that again. Because I just felt completely stupid, so I never wanted to ask for her assistance again.

Heather, for example, expressed her reluctance to seek help from others, as she feared being judged by others and looking "silly" before other colleagues: "you realise that you are slower than some of the others, and so they are moving ahead and you feel a bit silly to ask too much". Jean's fear of losing face has made her seek help from her family, reluctant to seek technological help from her colleagues, so as to avoid feeling "shy", "left behind" and "inadequate":

> I would prefer to go with family, and probably I feel less shy with family. I have got some people at school that I would ask, but I feel that would take me longer to learn being older [...] And then I will be asking the same questions again, so I definitely feel left behind, well not left behind, but inadequate but definitely left behind with young people at school. So I have got key people but I prefer to go to my children.

In summary, this section suggests that change with ICT may not happen unless one is willing to embrace it. A positive attitude towards learning in general, and ICT in particular is important in this process. On the other hand, influences such as techno-anxiety, slow pace of learning, fast pace of forgetting, and fear of loss of face may hinder this process. These influences may relate to the teachers' lack of technological skills and technological pedagogical content knowledge. In other words, the more teachers know about how to use ICT in second language pedagogy, the better they may embrace new patterns which involved ICT use in their classroom pedagogy. Many teachers appeared to believe that a slow paced ICT-related professional development programme which has been adjusted to their needs might positively influence their progress towards change with ICT. For instance, Jamie argued for providing more customised PLD sessions and Fred reported the need for a "step by step" learning process particularly for the older teachers. Critiquing the current practices and approaches to ICT PLD,

Melanie and Heather expressed that they would have liked a more personalised one-to-one professional learning development programme which took into account their generation's needs and learning pace. Heather explained:

> Because they moved too fast for me, because they have these ICT PLD sessions, we are all in the computer room, and the teacher is teaching and I am trying to follow, and I'm not good at ICT. I feel I need the one-on-one, and they haven't got the time for me to do one-on-one.

This section presented a range of factors related to teacher personal characteristics reported to influence teachers' ICT adoption. However, teachers reported that such issues may be reduced or resolved through appropriate learning opportunities. Hence, the following section elaborates on how and in what ways professional learning and development opportunities can contribute to teacher ICT integration.

5.3. Teacher professional learning opportunities

In the previous section, a range of influences on teachers' ICT adoption was identified. The evidence suggests that such concerns may stem from the teachers' lack of technological skills and technological pedagogical content knowledge. Many teachers appeared to believe that many of these concerns can be addressed with appropriate ICT PLD. Borg (2015) states that teacher prior schooling and professional learning has a significant influence on language teacher practices and their classroom pedagogy. Hence, this section reports on the sorts of ICT professional learning opportunities reported to be available to ESOL teachers and how they contribute to teachers' ICT professional knowledge development. This is presented under two main subheadings, i.e., formal and informal ICT-related professional learning opportunities below.

5.3.1. Formal professional learning opportunities

Formal professional learning programs are frequently part of teacher registration requirements. They are purposefully planned and usually take place in the universities, school or other educational institutions. They may or may not involve a formalised assessment or formal accreditation. These form of learning opportunities include Initial teacher education (ITE) programs, In-service Professional Learning Development (PLD) workshops, teaching-as-inquiry research projects, leadership coaching, and ESOL teacher cluster programmes.

Initial teacher education. Explaining about learning opportunities for ESOL teachers, Kali explained that "there aren't really any specific training courses for ESOL teachers". Consultation with three of the experts, Davy, Cunningham and Wise, also confirmed Kali's concern. They reported that it would be rare to find ESOL taught as a standalone subject area in ITE. They further explained that some universities in New Zealand such as the University of Canterbury and the University of Waikato, do offer a qualification in Teaching English to Speakers of Other Languages (TESOL), but they are at the postgraduate level.

Even with the available programmes in New Zealand, there were very few of them with specialised focused in CALL in general or in ESOL in particular. Claire stated that when she was doing her postgraduate degree in TESOL, she had to take general a e-learning courses and plan her project towards e-learning in ESOL, when she wanted to upskill to introduce more ICT in her teaching: "As part of the requirements for the completion of the course, I did an e-learning paper and concentrated on a research project about Moodle… and that impacted my teaching". Consultations with Cunningham, as an expert in CALL teacher education programmes and surfing some of the New Zealand university webpages such as the webpage related to language and literacy education or additional languages in Waikato University, did not suggest a particular focus on CALL at the time of the data collection. According to

Cunningham, the University of Canterbury offered the first and so far the only Master's programme with a particular focus on Computer Assisted Language Learning in New Zealand from 2015, although it should be noted that this programme was not available until after the data collection process for this thesis. Lack of attention to ICT was also reported in other English language teacher training programmes such as the Cambridge Certificate in Teaching English to Speakers of Other Languages (CELTA). The teachers who had attended these courses or other similar language teaching qualifications, referred to the lack of systematic ICT integration instruction. Sandra, who had recently passed the course, reported a lack of ICT integration in her CELTA course: "We didn't use that much ICT in our CELTA course. They used a lot of papers, a lot of pens". In line with Sandra's claim, an analysis of the documents and syllabus related to the CELTA course syllabus (University of Cambridge ESOL Examinations, 2010) provided by the anonymous CELTA course coordinator in New Zealand, as well as inputs from her, revealed that ICT integration was not a priority in such qualification. She reported "zero" presence of ICT in their CELTA programmes.

Professional learning and development workshops. Relevant PLD workshops, held by and within the schools themselves or by other PLD providers across schools were other possible sources of learning for teachers. Many teachers reported that professional learning opportunities and workshops especially when focused on ICT, had the potential for motivating and raising their awareness about different ways of implementing ICT into their teaching. Such PLD workshops were reported to be useful when they address teachers' specific needs and teaching context (i.e., they are directly relevant), are of sufficient quantity (frequency) and are of high quality in their presentation (pace and instruction).

The majority of the interviewed teachers appeared to prefer more specialised, subject-specific PLD workshops as opposed to more generic ones. Melanie, Rebecca, Mary, and Claire reported

that they found the ICT related PLD workshops were most useful when they were relevant to ESOL contexts. Rebecca and Mary, for instance, mentioned that they had to work hard to transfer their knowledge of ICT tools to their ESOL context if they wanted to benefit from the general PLD workshops. Tired of trying to find connections in general ICT PLD workshops, Melanie appeared dissatisfied with the amount of "irrelevant" workshops she "had to" attend in the school as a job requirement, even though she did not find them productive:

> It's part of teachers' professional development to learn how to do more and more things on the computers. I have attended my schools' PLD sessions, but often these sessions are for the things that I don't need to know.

Some teachers such as Joseph appeared to blame the MOE for "[not placing] much emphasis on ESOL technology". Sandra, Sue, and Kali also expressed their concern about the limited focus on ICT and criticised the content, frequency, and quality of ESOL-related PLD. Sandra explained: "There are not any technology-related ESOL programmes, not as far as I am aware of. There are some programmes, but it's just exchanging resources. There is nothing really about technology". This situation was confirmed by Fry, who was one of the experts in the study as well as an ESOL facilitator at the time of the data collection. She explained that despite the 2006 e-learning action plan, there was very little, if any, emphasis on ICT-related PLD for ESOL teachers up to 2014. However, according to her, there has been a number of ICTPLD initiatives and workshops since then.

In addition to the content of the PLD and its relevance to ESOL, the instruction mode, and the number of attendees, particularly for many older teachers, was another issue influenced the efficiency of the PLD workshops. The positive influence of attending to the pace and quality of instruction is implied when Mary stated that her "whole way of teaching changed" because

of going to “an interactive ICT PLD”. She “loved” the PLD workshops and identified the step-by-step instruction and situated problem-solving as the key to the success of such workshops.

However, not all PLD workshops demonstrate such qualities. Jean, when referring to the importance of the quality and pace of instruction, explained that PLD programmes might have provided her with an opportunity to develop awareness of different software, if they had been led at a slower pace. The high number of attendees in the PLD sessions, usually held outside the school appeared to reduce the quality and effectiveness of the workshops. Teachers, especially those who had had less exposure to ICT and who grasped things at a slower pace, had problems keeping up with their peers in over-populated ICT PLD workshops. The one-off stand-alone ICT PLD workshops that had no follow-up or situated learning sessions, were another concern for these teachers. Becky, Heather, and Melanie criticised such conditions. Melanie sought an “interactive kind of PLD … where you participate, where you do, where you have feedback”. Dissatisfied with her PLD sessions in general, Heather continued:

> You could have forty teachers and one computer suite at once. Or you could have the whole staff in a big room, with a board and people teaching from the front. So a lot of it is show and tell, show from a front, telling click on this … And I want individual help. So the individual help is when I need it and I don’t get that.

Some teachers reported feeling more comfortable in those PLD sessions that were conducted by practising teachers rather than IT people, as they appeared to believe that, teacher-instructors usually drew on their own experiences with that specific ICT. This saved teachers’ time as it helped them to choose a suitable ICT tool more easily and comfortably. It appeared that teacher-instructors could better support teachers with a practical lens which help them to connect pedagogical aspects of ICT to their own teaching contexts. Nora found those PLD

sessions conducted by technology-savvy, friendly, and supportive teachers in her school were "really good, effective, and useful". These ICT PLD sessions were conducted based on the needs analysis done by the administration:

> The teachers who run it are not from the IT department. They are teachers who are interested in computers [...] they are very good at sharing and helping. They are very supportive. […] Our PLDs are quite often what we really need at that time or what teachers used and found useful.

In some schools, certain other people such as the principal assumed a leadership role for ICT initiatives. For instance, in the school where Claire worked, the school principal was the one with the most exposure to ICT workshops. He took on the role of leading and supporting the development of ICT integration in his school, as a techno-savvy person:

> The principal of the school who has the expertise because he used the program and proved it to be very successful, passed on what he knew to us and we set ourselves goals to start using the same process as a group, so that we all developed in our expertise.

Leadership coaching appeared to create a safer environment for more vulnerable teachers who might get puzzled or frustrated in more generic and populated learning environments. Some teachers such as Jean also reported on the MOE's TESSOL tuition fees scholarships to teachers who were willing to enrol in a more sustained and academic programme of study. This was done on the logic that "having teachers with a Teaching English in Schools for Speakers of Other Languages (TESSOL) qualification in the schools will improve the outcomes for English language learners" (Ministry of Education, 2018b). However, as discussed in the previous subsection, not much focus on ESOL related ICT pedagogy is present.

Teaching-as-inquiry. Technology-related research projects stemmed as part of teachers' teaching-as-inquiry were other possible forms of formal learning for teachers. Teaching-as-inquiry has been practised as part of the revision of teacher registration requirements in New Zealand since 2011 (Ministry of Education, 2011b, p. 1). It is a cyclical approach to teaching where teachers' focus is on identifying students' needs and selecting and implementing appropriate and relevant strategies to deliberately target those needs. According to the MOE, the primary purpose of teaching-as-inquiry is to "improve outcomes for students through purposeful assessment, planned action, strategic teaching, and focused review" (Ministry of Education, 2011b, p. 1).

Some teachers such as Gloria, Heather, and Becky applied some ICT tools in their classroom as part of their teaching-as-inquiry project. Gloria found teaching-as-enquiry "as an effective way" because it forced her into action by recognising the problem and finding a solution for it. In a similar vein, Heather's initial incentive for integrating ICT in her classroom pedagogy was through her teaching-as-inquiry project:

> I have personal research to do as a teacher for my professional development in our school. You choose a topic, and you study it for a year or two, like I did vocabulary for the last two years: How to best teach vocabulary in the classroom. I get lots of ideas for teaching vocabulary with technology.

According to Davis, who was one of the experts in the study, such teaching-as-inquiry projects are "supposed to give teachers more opportunity and lead in their professional development if the teachers get the needed help, otherwise it will just turn into an additional expectation".

English Language teacher clusters. Before continuing with this section, it is important to indicate that the term *teacher cluster* signifies a group of teachers gathering together for a

particular purpose and it differs from the concept of school clusters used in the New Zealand education context.

Another source through which teachers reported improving their professional knowledge including CALL knowledge was their engagement with colleagues via face-to-face and virtual teacher-led communities. National professional associations such as Teachers of English to Speakers of Other Languages Aotearoa New Zealand (TESOLANZ) and its local branches such as CANTESOL (Canterbury Teachers of English to Speakers of Other Languages), language-related conferences such as CLESOL (Community Languages (CL) and English for Speakers of Other Languages) were some of the ways through which the teachers reportedly developed their professional knowledge. Some teachers, including Heather, also reported secondary ESOL teacher clusters as another source of reference to compensate for insufficient PLD workshops for ESOL teachers in general and the use of ICT in that context in particular. Heather explained her use of various sources as: "I have to rely on my national body, my cluster meetings, my CANTESOL, my advisor's notes, my other ESOL teachers throughout the country to answer my questions and get help".

One of the approaches through which teachers developed their professional knowledge was attendance at conferences such as CLESOL, a popular biennial conference for ESOL teachers around the country. However, it appeared that ICT integration received little attention as a theme in these conferences at that time. Jacky reported the need for more attention in such conferences, and stated that "Unfortunately, there isn't much emphasis on ESOL and technology even at conferences".

Secondary ESOL teacher cluster groups run by ESOL teachers were another form of professional learning for teachers. In these face-to-face meetings, ESOL teachers from different secondary schools met once or twice a term to discuss emergent issues in ESOL including ICT

integration, share their practices and discuss their pedagogical problems with others in their geographic region. For instance, Melanie and Kali reported such meetings as a reliable, professionally specialised environment to attend in order to share information, benefit from other peoples' experiences, and broaden their professional horizons. Kali explained: "Sometimes people in their cluster would share what they have been doing or what has worked, and that's useful. It stops you from making mistakes". Sue also valued the interaction and communication that took place in such meetings as a means to developing teachers' pedagogical and technological knowledge: "Teachers are always trialling and doing different things and tend to report them more in professional learning meetings".

It is worth noting that even though such meetings were perceived to be a beneficial source of insight and knowledge, they were not available to all teachers. Firstly, such programmes were not always held on a regular basis in some places. Joseph, for example, stated that "We occasionally have group meetings. We haven't had any this year. We had some last year". Secondly, attending these meetings turned out to be difficult for some teachers due to time and geographical constraints. For instance, Claire stated that she could not attend these meetings as "the nearest meeting place would be an hour drive".

So far, it can be concluded that the formal professional learning and development opportunities appears to have an influential role in supporting the teachers with their technical and pedagogical needs, providing the teachers' needs and concerns were addressed properly. However, there was little attention to CALL in general and ESOL as a field of study in particular in such programmes. In addition, many teachers expressed dissatisfaction with some aspects of these learning opportunities on offer. This makes the attention to other forms of learning more important. In the next section elaborates on the informal learning opportunities

that were reported to be available for the ESOL teachers through which they could enhance their pedagogy in general and their ICT practices in particular.

5.3.3. Informal learning opportunities

The term *informal learning opportunity* is used to refer to the teachers' self-directed learning as well as all the kind of influence, support, and instruction teachers received when interacting with their techno-savvy colleagues and technicians in online and face to face environments, as well as similar support from students, friends, and family members. Such interactions were incidental so that formal planning was not involved. Claire, for example, described that her informal interactions with people in her immediate environment had a profound impact on her learning process: "You learn from everybody: colleagues, friends, students, teachers in the community. So it's like a learning community". Other teachers, including Becky and Sue, also valued the role of connections and support of a group around them for their ICT uptake. Sue argued:

> If you are not connected, you wouldn't know and you wouldn't use [ICT], and that is the problem that I find. I use a lot of programs that other people don't, simply by the fact that I have a lot of connections in education.

Self-directed learning. Being an independent learner and teaching oneself appeared to play an important role in teachers' learning process. The self-generated learning goals and learning strategies that ICT users such as Fred, Nora, Claire, and Sandra applied appeared to have an impact on their learning processes and outcomes. Fred "loved" his self-directed learning attempts, because it provided him with "an opportunity to explore new things and develop them" at his own pace. He continued: "I spend a lot of my leisure time to get to the deeper levels of how I can use [ICT]". Nora strongly believed that she had gained her knowledge of

CALL by autonomous learning through surfing the web. Asked about how she had developed her technological knowledge, she replied: “Mostly, I just have taught myself”. 54-year-old Claire, a frequent ICT user, emphasised her interest as “craving the [ICT] knowledge” as the key to her success. These teachers reported taking small steps at a time, being selective about the ICT tools, taking notes and persevering in using the tools as some of strategies that helped them to learn,

Discussions with colleagues and technicians. Amongst the various informal forms of learning, the majority of the teachers considered casual discussions with colleagues or taking note of their practices in their work environment as one of their main sources of learning. This informal form of learning was valuable owing to its offering a less intimidating learning environment. The fact that such knowledge had usually been tested and approved of by the person sharing it made it even more attractive and reliable. Fred explained that other people’s evaluation of a program or tool was imperative in his developing a sense of trust in that particular piece of software for uptake. Hence, the more teachers received practical and pre-tested knowledge about different ICT tools, the greater is the likelihood of their integration. Kali, for example, indicated that she is more willing to use an ICT tool if “somebody else has used it and indicated that this was really helpful”. Rebecca, too, affirmed the “influences from colleagues” as important and Linda referred to the stimuli of the “initial push by others” as a powerful starting point in her uptake: “I think if someone actually shows you something useful, then you are more likely to do it”. Amy, also acknowledged the role of her colleagues in developing her own interest in trying new ICT tools and Joseph explained that his use of smartboards had been in fact prompted “just by talking with teachers on how to use them”.

IT technicians also helped with the development of the teachers’ professional knowledge at a very limited level. First of all, the technicians were seen to focus mainly on the technical side

of ICT tools rather than the pedagogical one. So, they were most beneficial if the teachers needed support with technical glitches. Second, their number was very limited in the school and, according to Heather and Sue, it often took time to get hold of them. This may be why Sue considers herself "lucky" to be in a school which despite support from technicians, she can rely on the situated and immediate ICT support of her seven ESOL colleagues: "We are very lucky here. We have got an IT department and a help desk, but often one or the other of us is in the classroom next door and we usually run across or grab somebody and they can help us". This underlines the important role of the ICT practices and the approachability of colleagues with ICT skills for other teachers' ICT practices.

The use of virtual mediums of communication and websites. Virtual resources were publicly accessible places, which supported teachers in gaining professional knowledge. Teachers benefited from the accessibility, immediacy, richness, and diversity provided by these virtual mediums of communication. Many teachers reported that such platforms furnished teachers with an excellent source of reference, a plethora of information, and individualised learning opportunities which mainly helped them for their course material development and professional knowledge.

VLN, ESOL Online, and English Online and their associated virtual communities were the main websites in reported use by the teachers. These websites have been developed by the MOE to assist teachers in establishing professional relationships with other colleagues and to update them with common trends and concerns in New Zealand ESOL and resources. The sites offered various resources and enabled their members to communicate interactively, share ideas, propose questions, and seek answers (Ministry of Education, 2015). Linda regarded such services as a great source of "clarification and support", and considerably benefited from teachers sharing their pedagogy and ideas for teaching with others in online communities:

> We have an email link with each other. So someone would just say: "Oh, try this [ICT tool] or have a look at that one, or just click on this and say what you think", and that's great. I have learnt a lot from them.

Likewise, Melanie, Sandra, Joseph and Claire referred to various online forums as a valuable platform to be both receivers and distributors of knowledge. Claire for instance kept herself abreast of new developments by being engaged in different online platforms added:

> I am on different forums, education forums, literacy forums, ICT forums and as much as I can keep up with all of those. What I do is I glean. Then I think: "Oh, that is a great idea", so I just put it into practice. There are some good things that come up on there.

It appears that one of the reasons that ESOL online forums were of popularity amongst the teachers was because the information was offered and validated by practising ESOL teachers. Although these interactive platforms were a convenient and immediate source of communication and information for teachers and helped teachers to become more aware of the current issues in ESOL as well as ICT integration in their context, they had their own limitations as well. First of all, they were very much limited to providing information at the surface level and did not provide much instruction on how to use a particular ICT tool both technically and pedagogically according to Fred. Also surfing the various sections of the ESOL online area of the TKI website, confirmed that not much information existed with a particular focus on CALL.

Another source of reference for teachers was the vast range of online resources and information produced for educational and language learning purposes, mainly produced by the teachers and teacher educators in the profession, and educational or commercial organisations. Search

engines provided an easily accessible source of knowledge and indeed the ‘go-to’ place for teachers. Teachers unanimously referred to their use of Google search to find out about ESOL-related materials, applications, and games suitable for their purposes. Melanie would go to what she called “practical websites” where she had the confidence that they would “usually bring something up”.

> Sometimes I would just go to Google and put in English classes and something like that and get hundreds of thousands of different possible websites [...] and there is so many to choose from. It’s just amazing.

However, due to the plethora of information such platforms provide, they become daunting for teachers trying to decide one the best ICT tools matching their unique context. Such online resources were, therefore, more useful when used strategically. Fred’s success in ICT integration was not because of random web surfing, but the result of a systematic, focused, and purposeful effort: “The best way is to have a problem and to find a way of using ICT to solve that problem”.

Family and friends. Another source of informal learning was the amount of exposure to ICT and support that teachers received from their interactions with their family members and close friends. Teachers appeared to be most comfortable learning within this circle. Not only did they feel more relaxed asking questions in this circle, but the fact they did not have to be worried about their professional ‘face’ being jeopardised in front of their colleagues, made this circle of people a valuable source for them. Mary, for instance, was waiting for the Christmas holidays so she could learn about some ICT tools from her children. Nora, found her daughter “very useful”, since she kept her “going and updated with new stuff” on ICT. Mary, Kali, and Melanie also acknowledged the benefits of having a tech-savvy person at home who could assist them with ICT. For example, Kali’s husband found useful language teaching software to

support her with Computer Assisted Language Learning goals in her classroom. Melanie's family members kept her updated with recent ICT: "My son is a computer person; that is his job. And my niece's husband is also a professional computer person, so they both kind of keep me up to scratch to what is going on". However, there needs to be a differentiation between learning about general ICT stuff as opposed to the use of ICT tools in language learning pedagogy. The family appeared to be most helpful to support the teachers with their technical glitches and general tools such as the use of social media or Skype, but not with CALL pedagogy.

The more teachers were in contact with a technology-savvy person, the more likely they were to become conversant with different applications and their possible uses. This, in turn, appeared to lead to a higher rate of ICT uptake and use. Amy, a technologically proficient teacher, believed that she owed her proficiency first to her interests, and then to her connections, and the technology-savvy people with whom she was in contact:

> I am connected quite well with the IT community, like outside of schools, and students at the university computer sciences. So, they are always coming up with 'Hey! You should look at this!', or 'Gosh! This is a new app', or 'I am doing this', and so, if it catches my imagination, I look at it and think how I can use that.

5.3.4. Summary

This section presented the complex interaction between ESOL teachers and different forms of ICT PLD opportunities available to them, both formal and informal. The type of ICT PLD available to teachers varied and teachers made use of these different forms depending on their needs, concerns, preferences, and their availability. Furthermore, the informal learning was highly valued due to its individualised and problem-based nature.

However, not all of the teachers reported using the knowledge gained through such ICT PLD in their ESOL classrooms. For example Amy who, despite her techno-savviness and her close connection with a circle of techno-savvy people, reported no use with her ESOL students. Other teachers also reported some concerns with regards to the suitability of ICT tools for their ELLs. This is explored next.

5.4. Student-related influences

Borg (2015) refers to the influence of context on a teacher's classroom practice, which includes what is around and inside the classroom. Hence, the ELLs can be considered as part of the teachers' context. The participants reported that their students influenced their classroom pedagogy. Students attending ESOL classes in New Zealand tend to be drawn from many different mainstream classes, which in themselves often have less diversity in student background, culture and learning objectives than a typical ESOL classroom. All of the 21 ESOL teachers interviewed often dealt with a diverse student population, whose needs, objectives, learning styles, computer literacy, linguistic background, language proficiency, socio-economic conditions and culture appeared to range widely.

ESOL Teachers' description of their classroom demography indicates that classes were often comprised of varied proportions of three main types of ELLs: (1) Ministry-funded ELLs; (2) foreign fee-paying students and (3) visiting/exchange students. These students came from diverse cultural and linguistic backgrounds, and their goals varied, leading to an extraordinary variety of needs, thus making the composition of ESOL classes very different from other classes in the same school.

When comparing the ESOL classroom with the rest of the classes, Fred explained that: "In the rest of the school there is more streaming, so teachers would have a more homogeneous class.

So they don't have that same problem of diversity that we have to face". This diversity consequently had an impact on the teachers' classroom pedagogy and their perceptions of the compatibility of ICT with their students' needs and culture. For instance, despite being a techno-savvy teacher and an active user of CALL tools in her Japanese language teaching class, Amy didn't use the same pedagogy in her ESOL classroom, as she said that she found it "impossible to teach [using ICT] with that level of differentiation and to that extreme". She added, "I can't do the same thing [use ICT the way she did in her Japanese class] in the ESOL. It just doesn't tend to fall that way". The strength of Amy's view about the incompatibility of ICT in the ESOL context was surprising, given the fact that she used ICT extensively with her other second language teaching classes such as her Japanese language students.

Such reports prompted me to explore further how such diversity amongst the ELLs influenced teachers' pedagogy in general and ICT practices in particular. Three main subthemes emerged from the teachers' reports on the multilevel, wide-ranging, and complex student-related factors. The three main subthemes to be presented next are students' pastoral needs, their educational needs, and their domestic schooling culture.

5.4.1. Pastoral needs

Students' pastoral needs concerned the type of support that some of the students needed to adjust to the New Zealand school environment and culture. As teachers reported, coming from a different context, in addition to linguistic needs, some of these students enter New Zealand schools with high needs for social, cultural and economic support. Being a newcomer to New Zealand, ELLs are at the early stages of developing connections with the people and the environment. Furthermore, coming from another country, they need to familiarise themselves with the new culture they have entered. Some of these students, such as refugee students, might have come from war-stricken regions, or from families with lower socio-economic and

educational backgrounds, and need extra support to survive, to become familiar to the new culture, and to settle in their new homes. Hence, attending to such needs and taking pastoral care of these students, both inside and outside their classrooms, was one of the roles that ESOL teachers strongly held themselves accountable for.

Many teachers reported that, as ESOL teachers, they built much closer relationships with their ELLs. They believed that they were more aware of the ELLs' needs compared to other school staff and mainstream teachers, especially given that these students would normally be referred to their ESOL teachers first in the case of any problem. As Claire explained, these students were "seen as a bit of an interruption or bother, and another thing that teacher has to do." She went on to explain that "sometimes other teachers don't really want to be bothered with them", especially given that these students might enter schools mid-year and hence cause a disruption to the flow of the mainstream classrooms.

Observing such behaviours towards ELLs, ESOL teachers reported feeling that they needed to provide more comprehensive and individual support for their ELLs. Joseph, for instance, pointed out that his role was to stand by his ELLs and assist them, since "these students' needs are not being met and the school is not living up to its responsibilities". ESOL teachers did not, therefore, see themselves just as an ESOL/language teacher but, as Sandra described, a "care agent, mentor, and counsellor".

As such, teachers tried to adjust their classroom pedagogy to meet such needs. Claire, for instance, noted that she needed to be alert to her students' needs for pastoral care. She referred to her ESOL classroom as "some kind of a home-room, which they feel at home in" and adjusted her teaching to their needs accordingly. Other teachers related similar accounts, recognising the need for such support for their students. Amy, too, described her role as making her ESOL classroom for students a place where they feel comfortable and relaxed, "They just

come into my class and shut the door and it's kind of like their little territory where they can just close the door and not have to deal with anyone else".

The ESOL teachers' concern for their students' pastoral care was not just limited to their classroom. On several occasions, ESOL teachers reported needing to raise awareness about and advocate for their students' needs and concerns outside their immediate classroom context. Both Gloria and Amy recounted instances in which they had had to support students and mediate between the student and the school by providing advice and insight into students' culture, of which, they claimed, other school authorities, such as faculty members, deans, and the Board of Trustees, were not sufficiently aware. Such instances added to the responsibilities of already busy teachers.

In such ways, concerns about their students' pastoral needs influenced the pedagogical choices made by some of the ESOL teachers. For example, Amy avoided using ICT with her students because she believed that ELLs already faced too many issues such as language barriers, culture shock, feelings of isolation and loneliness. She felt that using a new ICT might place extra pressure on them, especially when they lacked sufficient technical skills:

> Because they are already in school and dealing with so much stuff going on, I don't want to overload them with computers and stuff. And I keep it very simple. I am probably more likely to expose them to things that I have done on the computer, rather than getting them to do a lot of stuff.

The range of their students' pastoral needs was not the only aspect to influence the teachers' pedagogy and their ICT integration (and deliberate lack of use of ICT); attention to students' educational needs was another key influence on their pedagogical choices in the classroom. This will be presented next.

5.4.2. Educational needs

The ELLs' wide range of educational objectives and linguistic needs also influenced teachers' use of classroom technologies. Teachers recognised this diversity of needs and reflected this in their ESOL classroom practices and material development. Normally, the main objective of non-NCEA students (such as exchange students) was to improve their general English language skills. Fred described this group as the most motivated in learning the language and held that they were "incredibly dedicated, doing whatever their teacher says". They followed their ESOL teacher's instructions, did their assignments and used CALL software to improve their language both in school and at home.

In contrast, and perhaps not surprisingly, the fee-paying international students, migrant, and refugee students' main objective was to pass their NCEA Level One, Two, and Three (see Section 1.2. on the New Zealand Curriculum). Most of the students who attended ESOL classes needed specific support to help them with their academic English language skills (EAP), for acquiring mainstream subject language and for comprehending their subject areas. As teachers indicated, these students showed little interest in any extra language learning activities. Hence, as Joseph noted, as an ESOL teacher he needed to address a range of English language skills for his students. More specifically, he had to address both his students' "survival English, social English, communication skills" as well as "accelerate their academic English, so that they can access the New Zealand curriculum, so that they can survive and learn in subject classes".

As a consequence of students' diverse educational needs and objectives, the material presented in an ESOL classroom had to be varied in content. Becky described her ESOL classroom as a "beyond-just-language classroom". Unlike English as a foreign/second language, classes where students' main focus was on general English language, using staged language learning books such as Headway, Becky emphasised that she was "not just doing the grammar and the

Headway book". In addition to the general language, she also had to focus on English for academic purposes (EAP), i.e., the academic English that students needed to master in order to be able to comprehend their mainstream subjects. She also explained that she also needs to help her ELLs with the mainstream content that the ELLs have difficulty understanding. Heather also reported the uniqueness and complexity of their content-based ESOL classes compared to other forms of language learning classes in terms of the classroom material available for the teachers and the content they needed to cover:

> Language teachers can follow a textbook because there is a lot around for that, for ESOL teachers, you are doing a potpourri of all sort of things. So all my reading and grammar and things I have to rethink all the time, how is this giving them the maximum help? In a language school they use a textbook. One at elementary, one at intermediate, one at pre-intermediate, one at advanced. If I did that, my students would never be ready for NCEA because those language books are designed for one year of study per book, and that is teaching five hours a day. I have got them for four hours a week maximum, and some of them, I had to get them ready for NCEA. So I cannot just sit down and follow a language text… this isn't working.

The students in ESOL classes also differed in their English language proficiency levels. Many teachers were not always able to categorise their ESOL classrooms based on their student's language proficiency levels, adding another aspect for consideration. Becky, Kali and Melanie among others reported such diversity in their classroom and characterised both the material development process and classroom management as hard and demanding. Melanie continued: "My students were all mixed-level. It is quite difficult to handle this class because different levels of English and different age groups were in the same class. It's hard". Becky too found teaching in such diverse classes "hard". She further explained "You have five years difference

in age, and abilities are different. That's the hardest thing probably … you have to go back and forth". Similarly, while acknowledging the complexity of managing such classes, Kali longed for ESOL settings based on students' language proficiency level: "It would be nice if we had classes for levels, you know a beginner, elementary, intermediate". Such settings are totally different from other language learning settings (such as teaching international languages) where students are grouped in different year level classes based on their level of language proficiency.

In order to address the complexities involved in such individualised teaching contexts, the ESOL teachers reported that they needed to develop their own teaching material and individualised lesson plans based on their individual student's educational objectives and language level. Many teachers including Linda, stated that they could not simply continue with one lesson, one set of materials, assessment tools, or even one teaching approach in their classes since the uniqueness of each student's educational needs in ESOL classes "require[d] differentiation within your teaching". Heather described the process of preparing and adjusting the materials as "very tiring and very time consuming".

In such a situation sometimes ICT were not perceived to be a suitable tool or a priority. These tools appeared to offer little support to teachers in such situations, except for the preparation and presentation of the materials. Although ICT and online resources could help with ready-made English language learning materials, the majority of teachers found their teaching content to be too complex and their students' needs too specialised to match with available online resources and ICT tools within the time available. This may be the main reason why Rosaline and Sue stated that they would rather develop their own materials than spend time browsing the web for material which would still need adapting.

Teachers were also ambivalent about the compatibility of ICT with their pedagogy and students' needs. For instance, Amy explained that her initial role as a teacher was to attend to her students' priorities in achieving their immediate needs and concluded that using ICT was not the best option for achieving such a goal:

> What is the best thing for students? I think that is what it comes down to. Lots of them, they just want to pass, get through, get their credits, and get out the other side. So, how am I going to help them achieve that? Maybe it's not focusing on so much technology.

Similarly, Linda gave precedence to the needs of her students, for the majority of whom the integration of ICT was not a priority: "Is it getting them to write a basic sentence or is it getting them to be able to research online? For my students doing online stuff is not actually a priority". In a similar vein, Joseph argued that "not much technology is involved" in meeting his students' "urgent needs". Not only did Joseph not find the available online and offline materials to be a suitable match for his ESOL students' educational needs, but pedagogically, he also indicated that his students preferred a more face-to-face teaching and learning style. Joseph described his unsuccessful attempts in encouraging students to use CALL software at home: "I tried to draw students' attention to some websites so they can assess themselves in self-study and practice, but they did not show that much interest". Other teachers also expressed similar observations. Such a lack of interest in ICT might be due to the impact of the students' schooling culture before they came to New Zealand. This is the focus of the next section.

Fred, however, was an exception in this regard; he tried to use ICT to overcome some of the difficulties with such diversity, especially with his mixed-level classrooms. This could be

explained by his knowledge of the affordances of some ICT tools, his knowledge of the strategic use of ICT tools and/or his school culture, which will be discussed in Chapter Six.

5.4.3. Students' prior schooling culture

Students' prior schooling culture was another factor that appeared to influence teachers in their integration of ICT. Often ELLs come from quite different cultural, social, linguistic and educational contexts, with each student imbued with their own prior learning culture. Such differences obliged teachers to be more aware of their teaching approaches and individual students' learning styles. Sandra explained about some of the challenges she faced in her pedagogical approaches in her ESOL classroom as opposed to her Japanese language class rooted in the students' prior schooling cultures, such as coming from a more traditional teacher-centred background:

> I also teach Japanese and the emphasis is games and interaction and a lot of fun. But it is very difficult to get some ESOL students to participate in games and it's because of their backgrounds, their cultures and where they come from, which is 'you sit, you learn'. So, what they have done in their country is the teacher stood up in front of the classroom and spoke, and they have learnt, and that is what they expect over here.

Students' previous schooling culture could create a dilemma for teachers in relation to their pedagogical approach and it also had influenced the educational tools they opt to use. The students' lack of sufficient digital competence, which may be a consequence of the students' previous schooling culture and/or the lack of access to ICT tools, was another influence which made ICT integration challenging for the teachers. Amy explained, "Most [of my ESOL] students come to school without any computer knowledge; very limited computer knowledge".

Acknowledging the fact that some of their students had not been accustomed to using ICT in their previous educational contexts, the teachers were cautious not to impose on them learning devices with which they were uncomfortable and unfamiliar. Linda for instance explained:

> A lot of students don't know how to do it because they wouldn't have done any of that kind of thing at school […] because they don't really use ICT at all at school over there [in their home countries]. They tend to have very big classes with a teacher using a chalkboard rather than, say, a smartboard or something like that.

Melanie reported that she became more vigilant around her use of ICT in her classroom when she noticed "the ones [students] who were used to using ICT enjoyed everything [they] did; but the ones who didn't know how to use it, it was all very frightening and worrying for them". In such a situation, one of the dilemmas teachers faced was whether to spend the class time on teaching the students about ICT or just to focus on teaching English language skills. Sandra, for instance, described conditions where she had to sit down and teach students how to use an application because of her student's limited digital skills. Kali and Heather also reported the connection between the students' digital competence and their decision regarding the integration of ICT in their classroom practices. The frustration that was involved in teaching digital skills and the potential technical issues that might follow after, made them reluctant to use ICT. Kali added that:

> It's quite exciting if kids will be able to use and work through it all right. But if you think that you are going to be continually stuck with these students, and they can't go through it themselves, then it's kind of hard.

Students' limited language level and limited ICT-related vocabulary, originated from their prior learning context further overburdened ESOL teachers who wanted to help their students

to develop their digital competence. Linda explained the additional effort involved in teaching the ESOL students "the vocabulary that goes with that [ICT]" first and then teaching the ICT itself. The situation became even more cumbersome when the students' English language proficiency levels were not up to the level of learning such concepts. Jean noted the influence of her students' language level on her ICT practices as: "I could talk about that [ICT] with my pre-intermediate. But with my beginners and elementary, I think it would be very hard to talk about that".

In addition to the complexities about ELLs' digital competency, conceptualising ICT as an educational tool and managing the students' misbehaviour in the classroom were other reported challenges for the teachers who were aiming for ICT integration. Amy explained that one of the difficulties she encountered was to alter some of her students' perception of ICT tools, since they perceived ICT as "merely devices they can use to communicate with other people and be amused by" rather than an educational tool that can help them in their learning. While students might try to keep abreast of the latest technologies for social networking and gaming, they were not necessarily well-versed in what Heather called the "intricate" uses of ICT for learning purposes.

As a result of some of the students' lack of familiarity with the use of ICT in educational settings, managing their behaviour in classrooms became an issue for the teacher. Teachers found what they deemed inappropriate behaviour on digital devices during class time quite disruptive and difficult to control. Amy said "one thing that restricts the use of ICT is students' inappropriate use of technology". Other teachers voiced similar concerns. Melanie pointed out the challenges involved in monitoring individual student's behaviour and the effort required to prevent them from accessing websites other than educational ones when they are connected to the internet:

> I book a computer room and get the girls to do Language Perfect on that. It was fun and they enjoyed it, but often they were sending emails to the friends back home when I wasn't there.

Expressing similar concerns, Becky decided to strategically familiarise her students with the culture associated with the use of ICT in educational environments, observing that a "very common attitude" amongst her students was "texting, and taking photos and selfies" in the classroom. She was "just gently beginning" to let the students use their phones only to "take a picture of the homework on the board [...] so they don't have to write it all down".

The teachers were not the only group who were weary of students' behaviour on digital devices, but many parents were reported to have similar concerns. Sue for instance, mentioned about the students' parents' concerns about their children's online behaviour when doing online tasks at home. These parents tended to be apprehensive about ICT, as they found it quite difficult to monitor their children's use of their devices, particularly if they were not technology literate. In addition, some ELLs' parents came from backgrounds with less favourable attitudes towards ICT. Hence, assuring and convincing the parents about the benefits of using ICT was another obstacle for the teachers. Sue, for instance, remarked that "You know they [parents] have a fear that the children would access stuff that will pollute them maybe".

5.4.4. Summary

This section argued that the wide range of diversity in ELLs' social, cultural, educational, economic, and linguistic backgrounds appeared to have prompted technology-using teachers to regulate the amount of their technology use in their classroom. Teachers reported different behaviours and pedagogical approaches in such situations. Some teachers such as Fred used ICT to address this range wide range of diversity and to provide a flexible environment, i.e., a

kind of learning in which the content and pace of learning are based on the individual needs of his students. Others such as Amy, Rosaline and Sue did not consider ICT a suitable tool given the complexities of their contexts.

In addition to the influences already discussed, the influence of the existing policies and school culture was another theme emerged to explain about the influences on the ESOL teachers' ICT practices. This is presented next.

5.5. Policies and school cultures

What happens outside the classroom also influences a teacher's classroom pedagogy (Borg, 2015). This can include what is happening in the school and outside that. ESOL teachers reported on the influence of existing policies and school culture on their ICT practices. This is presented in the following three subsections: the way in which ESOL is recognised in this country, the availability of resources, and finally the influence of national and international assessment policies.

5.5.1. Recognition

How ESOL is perceived and placed in the New Zealand curriculum (see Chapter One) was an issue that appeared to have a considerable impact on the ESOL teachers. The policies set out by the New Zealand Curriculum did not recognise ESOL as a discipline content area in its own right (Ministry of Education, 2007), but according to Fry, one of the experts "as an extension of a statement about literacy" which crossing over all learning areas. As the participants explained, such conditions left management in individual schools to decide subjectively about the placement of ESOL. Consequently, it placed ESOL under the English Department in many schools; the Languages Department in some schools; and occasionally it was given a status as a separate department. When differentiating between content and pedagogy, many teachers felt

that pedagogically speaking, ESOL was better when aligned with a Languages Department than elsewhere. In this way, ESOL teachers would have better opportunity to update their knowledge, develop their pedagogical skills, and be better informed on the use of CALL tools through their interactions with other languages teachers. On the other hand, because of the importance of NCEA exams, and their relationship with English language literacy, ESOL needed strong connections with the English Department. Many teachers, therefore, believed that having a place where they could conveniently connect to both Departments was necessary. Along the same lines, Becky stated that:

> I feel we need a foot in both camps, but I've never seen that done. Because of NCEA, we need a foot in the English Department, because we need to align ourselves to see what the standards are. But I also feel that we could benefit a lot from talking with the language teachers and seeing what are the teaching techniques that they use. There were so many things that connected to the teaching of a language no matter what the language.

Furthermore, a lack of a clear position appeared to have created informal policies that were unfavourable to ESOL teachers in some schools in terms of the status and recognition of ESOL. As an explanation for such conditions, Heather claimed to have been told by the principal that "since EAL is not part of the eight learning areas in NZ curriculum, it cannot have the same status as a learning area". In a similar vein, Melanie felt marginalised since in her workplace "ESOL [was] not seen as a great priority" and its benefit to the school and the students was not appreciated. It even appeared that, without consulting Melanie, the school had decided to close down the ESOL unit. Such lack of recognition and teachers' feeling of marginalisation appeared to have hindered teachers' request for change and limited some teachers in their collegial interactions and connections with relevant departments.

In contrast, a positive school culture can motivate teachers to become more actively involved in school affairs. Sandra and Fred, two of the high ICT-using teachers appreciated the positive attitude of the school they worked in towards ESOL. Not only had the school culture's valuing them as experts in the field positively influenced Sandra and Fred to be more innovative and updated, but it had also made them leaders for change with ICT in their school. Discussing the characteristics of her school, Sandra stated that her school had "very good ESOL policies, and the Head of the Department and the school principal are very, very supportive" of what she did. In addition, she had positive collegial relationship with her colleagues as "the majority of teachers see ESOL teachers as a valuable resource". Consequently, Sandra was proactive, enthusiastic, and updated with ICT and played more of a leadership role in the school, actively using a range of different applications, such as Facebook and Raz-Kids in her teaching.

5.5.2. Availability of the resources

Availability of the resources was reported by the majority of the teachers as another major influence on teachers' ICT integration. The approaches towards ESOL nested within national and individual school policies appeared to have created some internal and informal influences on the type of facilities, resources, space, and funding allocated to ESOL. Nora and Maxine for instance referred to ESOL classrooms as "often under-resourced" and "very old fashioned room with just a whiteboard". Frustrated with her situation, Becky was critical of the "whole attitude to ESOL as a second-class subject" and the fact that she had to sacrifice her time and "fight" for even basic equipment such as textbooks, projection facilities, and computers. She further expressed her dissatisfaction with classroom conditions and the fact that her school usually allocated the smallest, least wanted, least equipped and most isolated rooms to ESOL. Some other teachers also referred to the constant battle for appropriate space.

Access to ICT infrastructure was also a concern for the majority of the teachers. They reported their access to ICT through one or a number of these five ways, i.e., teacher laptops (TELA), having fixed computers in the classroom, computer labs, Computers on Wheels (COWs) and Bring Your Own Device (BYOD). In most of the classes, fixed personal classroom computers (PCs), the teacher's laptop and the video projector were part of the classroom setting. However, the number of classroom PCs available in such classrooms varied from only one computer to a very rare case of fourteen computers. Jean also stated how her lack of access to computers impeded her practice: "I have only four computers in my classroom, which is not enough for me to work with".

The use of Computers on Wheels (COWs) offered another form of digital access. COWs is a portable system in which a number of notebooks and laptops were transported from one location to another within the school on a custom-designed trolley. However, accessing a COW was frustrating for many teachers. Rebecca and Claire, for instance, were reluctant to use these computers because of the amount of time and effort involved in making them ready for use. Claire had only three computers in her classroom of seventeen students, so she had to use the COWs, which was frustrating, "I have to go and get the COWs from someone else and bring it in and unchain it and you know, half of the lesson is gone before they are up and running and that is very frustrating". Melanie also would have liked to have computers in her classroom so she did not need to spend time "chaining and unchaining" the COWs. In addition, the ICT that was available did not always serve user expectations. Melanie, for instance, "had to use the silly little netbooks" available to her which she could "not print off them or anything like that". Furthermore, the teachers, who wished to use the COWs were required to book them in advance and transfer them to the class for an hour or two which required advance lesson planning.

Computer labs were another mode of access to ICT tools. However, computer labs were not a convenient option for these teachers either, since they were few in number, competitive to book, and had to be booked in advance. Linda explained: “You have to book them in pretty early, especially if you have a bigger class”, so that they are not all booked out by other classes. Lack of administration rights on shared devices for downloading or installing software was another issue raised by Sandra and Amy as inhibiting their ICT integration.

Although expecting students to bring their own devices to school (BYOD) appeared to be a good policy for the students who could afford to bring their own device, this was not seen as an ideal option for some of the ELLs for several reasons. Barbara explained: “Not all the students have devices to bring in because of financial issues”. Joseph also raised similar concern: “not all students have a laptop and not all people have that much internet access at home”.

Another concern for ESOL teachers was insufficient pre-made ESOL-related materials to be used with ELLs. Claire explained: “Teachers are struggling to find those resources which they really need to help them”. Likewise, Kali also wished the MOE would produce more ESOL ICT-based resources. According to Fred the availability of more practical resources would encourage teachers to use ICT in their pedagogy. As presented earlier, due to lack of availability of relevant resources, the teacher had to develop their own material, which they perceived it as a very time consuming process. This eventually hinders their inclination towards ICT integration.

5.5.3. Paper-based national and international assessments

The incompatibility of assessment rules and regulations with ICT use made the participants cautious about using ICT with their ELLs. At the time of data gathering, almost all the

examinations, including NCEA and International English Language Testing System (IELTS) tests, were paper-based. The students had to handwrite the exam and were not permitted to use any kind of ICT tools in their assessment, including digital dictionaries. Hence, some teachers reported reservations about using ICT with their ELLs, as they believed they need to prepare their students for such assessments. Kali for example stated that she would not use too much ICT with her students because "all of the assessing is done through paper; you have to write on paper. You have to prepare them for that". Similarly, Linda expressed similar concerns over the incompatibility of the assessment rubrics with ICT use. Often she had to avoid the use of word processing software and digital dictionaries to allow her students to practise their handwriting and develop their skills in looking up a word in a paper-based dictionary:

> […] with ESOL unit standards, those assessments, they have to be handwritten. They are not allowed to be typed so when they have to be handwritten, you have to give students opportunities to practise handwriting [...] though for ESOL unit standards they [digital dictionaries] are not allowed; it has to be paper-based dictionaries.

5.6. Conclusion and the way forward

This chapter presented a wide range of influences reported to contribute to teachers' ICT practices under four main themes, i.e., teacher ICT competence and willingness to change, teacher professional learning opportunities, student-related influences, and supportive policies. However, the list may be limited to what the teachers' perceived as most relevant and important to their ICT practice, indicating the possibility that there might be other factors that was not reported by the teacher.

The findings indicates that the teachers were diverse in their concerns, their approaches to learning, and the kind of learning opportunities available to them. ESOL teacher also dealt with a wide range of student with diverse educational, emotional, and socio-economic needs. In the midst, a range of policies and the school culture influenced their position in the schools. The sum of these reasons made ESOL context is a very complex one. Integrating ICT into such complex context made it even more complex, as these challenging conditions were not independent; they interacted and influenced one another. Hence, using applying Davis's (2018) Arena framework, the next chapter elaborates on how these factors relate, interact, and influence one another.

Chapter Six
Vignettes of Three Participants' Reported Views Mapped onto Davis's Arena of Change with ICT

6.1. Introduction

The findings from Chapters Four and Five reported on a wide range of influences that appeared to have an impact on the ESOL teachers' ICT practices in New Zealand secondary contexts. However, the picture appeared to be more complex and, therefore, further analysis was required to appreciate the ways in which these influences interact as well as the relations and inter-relations between them. Hence, in this chapter will answer research question three using Davis's (2018) Arena framework (see Section 3.3) to explain how a teacher's behaviour evolves over time and varies with the behaviours of interacting ecosystems. The framework adopts an ecological perspective and views the change holistically by mapping to identify the interrelations and intra-relations between the teachers and the interacting ecosystems that they inhabit at local, national, and global levels. It allows for a deeper interpretation of the process of change with digital technologies by presenting the influences on change with digital technologies through five different sectors (Resources, Professional, Family, Bureaucratic, and Political).

To present a holistic view of the players (living and non-living matter) who influenced each teacher's ICT practices, this chapter begins with interpreting the findings from Chapters Four and Five in relation to the Arena framework. Then, for deeper analysis and understanding, three individual ESOL teachers under the pseudonyms Jean, Fred, and Amy are individually presented in the form of vignettes and mapped into the centre of an Arena. Furthermore, Davis's (2018, p. 143) four staged synthesis of concerns-based adoption models is used to explain teachers' concerns (see Section 3.3).

6.2. Interpreting the findings in relation to Davis's Arena framework

Chapter Four presented some evidence in relation to the resource sector including the living and non-living matter that could be found in a cloud ecosystem within which ICT tool(s) are found and evolve. It discussed the selected ESOL teachers' behaviour inside the classroom by explaining about some of the ICT tools used and its pedagogical functions in an ESOL classroom. These ICT tools included both generic tools such as word-processing and presentation software as well as the ones that appear to be particularly designed for educational purposes, such as Raz-Kids, Quizlet, VoiceThread, SpiderScribe, and digital dictionaries. It also offered some insights on the range of diversity that existed in ESOL teachers' e-maturity level.

Chapter Five presented the influences on the teachers' ICT behaviour at classroom, school, national, and global levels. The ELLs' needs and concerns were one of the common influences reported at classroom level. Professional ecosystems where ICTPLD can be found presented the influences of a range of formal and informal learning opportunities available to the teachers at school, regional, national, and global levels. These ranged from the PLDs available to the teachers in the schools to professional education at educational institutes and universities. Collegial relations and connections with ICT-savvy people take place through face-to-face interaction, such as secondary school ESOL clusters and the TESOLANZ association and via virtual learning communities such as VLN. TKI and online resources were also illustrations of the influence of the professional sector in online ecosystems.

The influence of non-living matter in Bureaucratic sector of the ecosystems was reported at school, national, and international levels. It included the school culture (expected behaviour) and school policies (non-living matter) at the school level, the Ministry of Education ESOL policies, funding, as well as national NZQA assessment rubrics at the national level, and IELTS

assessment policies at the international level. There was also some influence of school cultures at the global level, such as the school cultures overseas and the educational ecosystems in which the ELLs had previously been educated in. The family ecosystems that included the students' parents and their cultures were also recognised as another source of influence on ESOL teachers' ICT practices.

Interpreting the findings from Chapters Four and Five in the Arena allows a holistic view of the living and non-living matter in all layers of ecosystems that teachers reported had influenced their ICT practices locally, nationally, and globally. However, it does not allow for in-depth interpretation of how and why this influenced individual teacher's ICT practices, nor it does not explain the wide diversity of the 21 ESOL teachers' ICT practices. Hence, in the following section, three contrasting cases are presented in the form of vignettes and analysed using the Arena framework. These three representatives of the wide variation in the data set were selected due to their contrasting professional practices and the rich data that they provided. Adopting this ecological perspective made it possible to explain the complexity in each individual teacher's ESOL context by clarifying the interactive roles of ICT, teachers, students, school leadership, policy-makers, and other educational and non-educational stakeholders in the ongoing evolution of this complexity.

6.3. Jean: Evolving with digital technologies

6.3.1. Vignette of Jean

In her 60s at the time of the interview, Jean had migrated to New Zealand from a non-English speaking country when she was nine years old. Initially a primary teacher, about thirteen years before the interview and in need for some change, Jean decided to become a secondary ESOL teacher believing that she could be more useful, having had the experience of being an ESOL

student herself. So, she earned a relevant language teaching qualification at a time when CALL was not yet part of the syllabus. She was working part time in a secondary school.

While wary of its "extraneous distractions", Jean said in her interview that she frequently used ICT at a basic level in her personal life, limiting her use to surfing the web, online banking, and connecting with family and friends. She had begun using ICT when she first purchased a computer a few years earlier. Initially, she felt "quite excited". She started to self-learn some basic programs such as Microsoft Word. However, she found herself "lagging behind" and "struggling", and feeling "overwhelmed" by the ever-changing developments in ICT and the push for its integration in her school as time passed. Although she tried different strategies to avoid such feelings, she appeared to fail. Hence, she reached a stage where she started to discard and "toss things away without even looking at them". She believed that other factors such as her age and its biological influences on her body, energy level, sleeping pattern, learning pace, old habits, the slow process of unlearning and learning, her busy lifestyle, and personal commitments further contributed to her struggle to keep herself updated.

Jean sought technical and pedagogical support in different ways. Consulting with "reasonably patient" people with whom she felt "less shy", including her family members, a few selected people from her work, and a busy ICT technician. Jean's other option was consulting with the staff who had the role to support teachers with ICT in the school. However, she did not always feel comfortable approaching them as she felt she was "taking up their time".

Jean also sought pedagogical support within her school's weekly PLD sessions, although she technically often felt "inadequate and left behind". Translating that knowledge into her own context was another problem, as was her own hesitancy about the pedagogical benefits of ICT to her particular ESOL context. Disappointed with the quality of the PLD sessions, she asked for more teacher-friendly PLD approaches for older teachers with aspects such as a slower

pace, step-by-step teaching, repetition of prior coaching, and more situated practice. Doing an online postgraduate diploma, also provided her with a practical opportunity to further engage with ICT. National and international online resources and her contacts with colleagues at school and the TESOLANZ association were other less formal sources of her pedagogical development in the use of ICT.

Unlike teachers in other departments, she could not divide responsibilities and share resources with her only ESOL colleague, mainly because of the different language levels they were teaching. In a similar vein, she reported that being part of the International Department and separated from a Languages Department hindered her engagement with the pedagogical ideas she deemed essential and particularly useful from the Languages Department. She appeared critical that her school designated "ESOL as a support", and did not recognise ESOL as "part of the languages and an academic subject".

Working in a public secondary school, Jean was in charge of all the students with lower English language levels. Her students varied widely; some were visiting or fee-paying international students and some were migrant and refugee students, for whom she had to apply for ESOL funding. They brought with them influences from their previous schools and family cultures, and they varied in their needs, learning objectives, language, and ICT skills. Her classroom was essentially organised as a study centre with very little whole class teaching. Hence, she reported that her work got "quite complicated" since she had to commit to "a lot of preparation and thinking" in order to prepare materials for both her NCEA and non-NCEA students' needs. Students' low English language level and ICT skills was another concern limiting Jean's instructional use of ICT with her students. Jean explained that the need to communicate using body language, especially with beginners, made the process of introducing ICT tools even more challenging.

Jean's school principal "love[d] technology" and was "pushing" for the integration of ICT and becoming a bring-your-own-device school, although Jean was ambivalent about the impact of such a policy on her ELLs from lower socio-economic levels. As a result of the whole school push for more ICT integration, Jean began to adopt more technology, integrating more audio-visual material in her teaching. Simultaneously, the need for constant updates on the school student management (SMS) and learning management systems (LMS) left her little time for preparation and learning about the CALL tools suitable to her context. The school infrastructure also demotivated her. The school's wireless network was not always functional, especially at the place where Jean's classroom was located. She also reported that having only four computers in the classroom, which she had "worked very hard to get upgraded" proved insufficient for effective ICT use in class.

The convenience and relevance of ICT for the students was Jean's other concern. She thought twice about applications that she felt were not pedagogically suitable for her students or which required too much time to personalise and manage. For instance, although she had begun using some cloud-based tools such as Google Docs and Raz-Kids, she had dropped them later on as she realised they did not match her pedagogical needs. Keeping students on-task and managing their behaviour was another "challenge". Plagiarism and going off-task with social media were some of the examples that she reported.

Taking an ecological perspective, this vignette has presented a glimpse of the multiple, complex, and interacting ecosystems within which Jean worked as an ESOL teacher of low language proficiency levels of English in a secondary school in New Zealand. In the following section, these are mapped into a global perspective using Davis's (2018) Arena framework.

6.3.2. Jean at the centre of the Arena of Change with digital technologies framework

The ecological perspective in the Arena in Figure 6.1 illustrates the complexity of change with digital technologies for Jean and the multiple ecosystems having an impact on the process of ICT uptake and use in her professional life. Although the evidence was limited, the evolution of ICT in Jean's professional life could be divided into two stages: once at the early stages of the development of ICT, when her life was less chaotic as a young primary teacher, and once at the time she was interviewed after she had become an ESOL teacher at a secondary school.

Jean's primary school class ecosystem consisted of two species coexisting with one another, i.e., Jean and her students (SSS). Jean can be viewed as a 'keystone species' as a primary teacher in the school ecosystem, with the greatest influence on the evolution of her class ecosystem. Along with her other colleagues, she was probably in charge of structuring the energy and resources (non-living matter) for her class. Part of such non-living matter was the curriculum, published textbooks, other resources, and teacher-made materials. Jean's inclination towards the use of ICT in her professional life was strengthened by her family ecosystem.

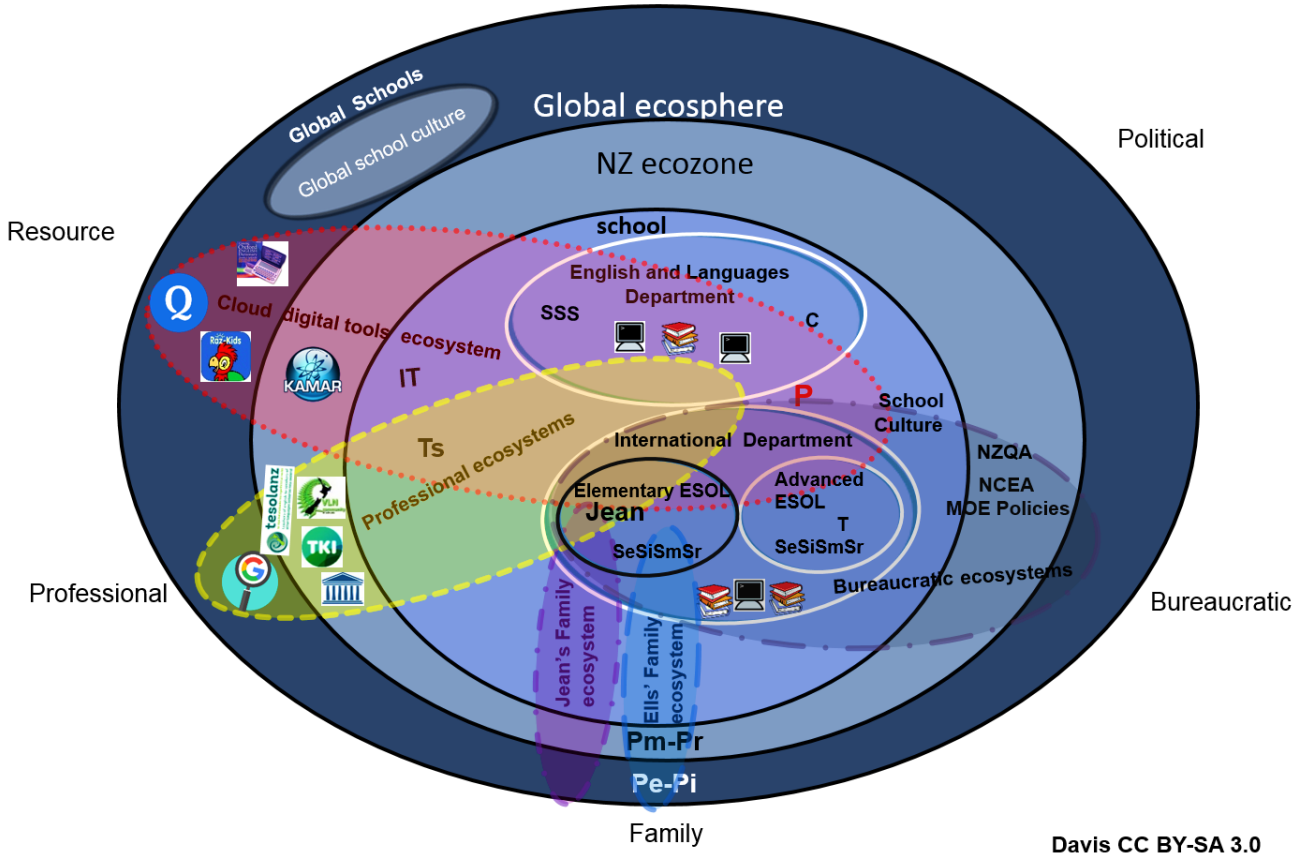

Figure 6. 1 The Arena framework with a two-dimensional helicopter view of Jean at the late stages of her teaching carrier as an ESOL teacher.

Key:

 Digital dictionary

 Digital device

 KAMAR

 Online resources

 Quizlet

 Tertiary Education

 Textbooks

 TESOLANZ

 TKI

 VoiceThread

 VLN

__.__.__ Bureaucratic ecosystems (Grey)

……. Cloud digital tools ecosystem (Red)

__ __ __ ELLs' family ecosystem (Blue)

_._._._. Jean's family ecosystem (Purple)

---------- Professional ecosystem (Yellow)

Advanced ESOL, ESOL for higher language proficiency level students; C, Colleague teachers in ESOL and English and Languages department, Electronic dictionaries, various offline and online tools for vocabulary definitions; Elementary ESOL, Jean's Class for lower language proficiency level students; English department, the department responsible for English literacy and world language; International Department, a department concerned with International student affairs and recruitment; Global schools in the global ecosphere, Schools located outside New Zealand; Global schools cultures, practices, pedagogies and policies in schools located outside New Zealand outside; G, online search engines and learning resources; IT, ICT technician; KAMAR, the SMS used by the school; Languages, world Languages department; MOE ESOL policies, Ministry of Education's ESOL policies; NCEA, National Certificate of Educational Achievement; NZQA, New Zealand Qualification Authority; P, school principal; Pe, exchange students' parents; Pi, international students' parents; Pm, migrant students' parents; PLD, professional learning development; Pr, refugee students' parents; Quizlet, cloud-based quiz software; School culture; Se, exchange students; Si, International students; Sm, migrant students; Sr, refugee students; SSS, non-ELL students in the school, Jean, the ESOL teacher; TESOLANZ, Teachers of ESOL Association of New Zealand; TKI, Ministry of Education's website; Ts, other non-language teachers in the school; VLN, Virtual learning networks.

With the emergence of new ICT tools and the co-evolution of the education with technology, Jean and her husband had made a mutual decision to purchase a computer as well as some instructional CDs. She was determined to develop her ICT skills, especially since ICT was new in the school ecosystem and it had not been part of Jean's pre-service teacher education programme. After some years, Jean left the primary school sector and joined the secondary ESOL ecosystem. Her ESOL class, mapped at the centre of the Arena in Figure 6.1, was an ecosystem within her school's international department ecosystem.

Jean had to accommodate a wide range of students (Se, Si, Sm, Sr) who came from diverse ecosystems and varied in their linguistic, educational, social, and cultural needs. Jean's informal professional development and pedagogical support in the school were weak. This was because there was only one other member of the keystone species of ESOL teachers in the ESOL ecosystem with whom she could interact so that there was limited commonality in content, material and pedagogy. Hence, unlike their other colleagues in the school, they were not able to share resources and matter that would otherwise have saved energy for other purposes.

Jean's school principal (P) was also a keystone species in the school because of his executive power. He pushed the school towards ICT integration and the BYOD scheme. He also had the power to oppose, with the merging of ESOL courses into the Languages Department, which, according to Jean, further isolated her from the learning opportunities possible in collaboration with the Languages Department. Feeling somewhat marginalised and alienated in her school ecosystem had impact on Jean's technical and professional development. She was reluctant to connect with other classroom ecosystems in the school, including other languages teachers (C), other teachers in the school (Ts) and an ICT technician (IT), partly because she was a part-time teacher and so had less presence in the school to connect and develop friendships with

colleagues. Hence, she was feeling less comfortable with her colleagues due to fear of losing face. Furthermore, there was a limited commonality in teaching material between her and other colleagues. Such reluctance is represented in the Arena (Figure. 6.1) by the minimum overlap of Jean's ESOL classroom ecosystem (surrounded by a black line) with other ecosystems such as the advanced ESOL classroom ecosystem, and other departments such as English and Languages department.

The blue (encircled by__.__.__ lines) and purple (encircled by __ __ __ lines) ovals stretched across all the layers of the Arena at the bottom of the figure represent the background and home cultures the students and Jean bring with themselves into the ESOL classroom. In Jean's case, these include her migrant background, coming from outside the New Zealand ecozone, her home and family responsibilities as a mother, wife, and daughter living in New Zealand, and her current role as an ESOL teacher. Her biological age and associated physical, mental, and social characteristics was another source of influence.

As for the professional ecosystems, which are represented in the yellow oval with (-------) lines around in the Arena on the bottom left of Figure 6.1, it could be argued that the availability and effectiveness of professional development opportunities strongly influenced Jean. She was trying to raise her awareness of the possible innovations, improve her personal skills, and evaluate the instructional implications of ICT in her ESOL context through the available PLD in the school. Furthermore, the slight overlap between the professional ecosystem (yellow oval) and Jean's ESOL class ecosystem indicates that the PLD opportunities available for Jean were few, given Jean's concerns regarding the pace of instruction and relevance to her teaching context. To fill this need, her initial source of reference for such support became her family members, presented through the overlap between family and PLD ecosystems in Figure 6.1.

Another connection with other ESOL teachers for gaining professional knowledge of current practices was through the TESOLANZ association, as well as national websites (TKI, VLN) and international online platforms. Furthermore, the presence of policies such as allocating TESSOL tuition fee scholarship (Ministry of Education, 2018b), had helped Jean to advance her knowledge in the fields of ESOL and ICT through a formal course of study. The overlap between the professional ecosystems with the resources ecosystem, which is the red oval (encircled by ……. lines) in Figure 6.1, indicated the co-evolution of PLD and use of cloud-based digital tools.

However, at some point, Jean started to limit her use of ICT tools since she could not keep abreast of the ever-increasing number of cloud-based ICT tools and the continuous evolution of hardware and software. Limited availability of the resources, including the number of the computers in her classroom and IT technician support, were also other influences of the resources ecosystem on Jean. Such facilities were also influenced by Bureaucratic ecosystems in the grey oval (encircled by __.__.__ lines) on the right side of Figure 6.1. The grey oval includes influences such as the presence of influential policies and national exam protocols (NCEA, NZQA) on Jean's and other ecosystems' behaviour.

Jean found it difficult in her multicultural and multilingual classroom to address the rapidly changing diversity of her students' needs and the consequent variation in which ICT tools that could be deployed. This was especially true since most of these technologies appeared to bring additional challenges to her classroom management, preparation, and administration, while other ecosystems were not sufficiently supportive of Jean. The complexity of her situation and her frustration intensified when she found herself isolated and with limited support. Hence, owing to such lack of fit, she became stressed in her school and class ecosystems. She appeared

to be shifting position from an active learner towards some rejection and, as such, she may have been becoming more likely to leave teaching.

The complexity of the educational ecosystems is illustrated in the Arena by mapping different ecosystems and the overlap between them in Figure 6.1. That is why it could be argued that while technologies are co-evolving with education, they are also evolving against it. In other words, while the evolution of ICT can positively influence the evolution of educational settings, it may also result in isolation and exclusion of teachers who may feel overwhelmed by the rapid evolution of ICT and education, despite their valuable professional expertise.

In conclusion, comparing Jean's professional life as a primary teacher to the time of the interview when she had become an ESOL teacher, it appears that over time the ecosystems that Jean inhabited had become more complex and intense and the pace of the evolution of Jean's behaviour naturally lagged behind the pace of evolution in other overlapping ecosystems.

The rapidly co-evolving educational ecosystems mapped in this section clarify the increasing complex behaviour of Jean. Using Davis's (2018) concerns-based adoption model with its four steps (see Section 2.4.4), Jean was an example of a teacher who remained in the early stages of change with ICT tools. Constantly moving between "Self", "Task", and "Impact" stages, she was trying to raise her awareness of the innovations and the personal skills she needed for adopting each tool, as well as developing her knowledge of different ICT tools and the impact of ICT tools in her context. For Jean, the support of others was crucial as she was often dealing with these three stages.

Jean was not resistant to technology. She was a good follower of others and had the motivation and willingness to integrate computers into her teaching. Therefore, should the professional learning development conditions improve, her uncertainty of some of the pedagogical

implications of ICT integration reduced, and sufficient infrastructure provided, she would be likely to adopt more ICT in her classroom.

6.4. Fred: A teacher leading change with ICT

6.4.1. Vignette of Fred

Fred was 67 and had previously worked as a teacher of English, science, and mathematics. He had left teaching for 25 years, during which he spent 15 years as a computer consultant. To return to his teaching career, he applied for an English position at a school but ended up in the ESOL Department where there had been a vacancy. As someone who, due to his age, would normally be categorised as a "digital immigrant" (Prensky, 2001a), he believed that he was using more technology than his "digital native" counterparts.

Fred's initial experience with ICT started when he found ICT to be an efficient tool to support him in his personal life with a particular challenge he was facing at the time. Later on, he used ICT for a range of different purposes such as socialisation, networking, and learning, including but not limited to listening to music and YouTube video clips, attending various online courses, and learning languages. His professional life was also influenced by his strong belief in the "efficiency" of ICT for administrative and pedagogical purposes. In his teaching, Fred actively used various ICT tools and applications such as smartboard, Raz-Kids, Quizlet, digital dictionaries, and audio and video files for instructional purposes and to enhance his students' engagement and language development.

However, such uses of ICT did not always come easily to Fred. In his interview, he explained that his knowledge and skills of ICT had been gained through many different "step by step" and "self-learning" mediums, accompanied by his "mental patience" and "perseverance". Fred had a problem-based approach to ICT integration, and for this, he had to transcend the "surface

level" and delve into deeper levels of the affordances of various technologies to assist him in resolving problems. In his current school, when he had not been provided with sufficient equipment in his classroom, Fred had invested in such digital facilities as a work laptop and a data projector from his own salary to prove them necessary and useful for students' learning. The school executive had refunded such expenses because they witnessed the benefits of "using them wisely". Since then, Fred had been equipped with 12 computers in his classroom, as well as a smartboard and the necessary software for them all.

Fred's situation differs from that of many ESOL teachers in other schools in terms of his position as an ESOL teacher and the positioning of ESOL as a subject area within his institution. Unlike many other secondary schools, where ESOL is often placed under English or in a Languages Department, ESOL functioned as an independent department in Fred's school, in close collaboration with both the English and Languages Departments. The Head of Department was "very keen on technology" and Fred enjoyed the company of other colleagues from the Languages Department, with whom he exchanged knowledge, although he pointed out that he knew "more than most people" and claimed he was "usually helping other people". Being from the same generation as the so-called digital immigrants (Prensky, 2001), Fred was well aware of the challenges that other colleagues experienced when learning ICT, hence his assistance and support were very much appreciated.

Fred's classroom consisted of students with mixed English language ability, learning objectives, cultural and socio-economic backgrounds. Not only did he need to deal with students with widely varying language skills all in one classroom, he also needed to address the diversity in his students' digital skills. While some students enjoyed extensive access to digital technologies, others had never previously worked with a digital device. With regards to his students' educational needs, Fred reported that his students also had different targets: while

exchange students needed extensive work to improve their general language skills, others such as international fee-paying students, migrant and refugee students needed intensive support to prepare for their national examinations. There was also great diversity in students' socio-economic backgrounds; many of his students who were short-term, international students or long-term migrants were likely to be from families with good economic resources, whereas the opposite was often more likely for the refugees.

To cater to such diversity, Fred used ICT to provide greater equity, access, and flexibility for his students. He divided his classroom time "between a fairly old-fashioned method of doing things, mainly digital ways of doing things collaboratively, and students working on their own". Not only did this division add further variety to his teaching, it also enabled the digitally disadvantaged students to practise autonomous learning. Meanwhile, Fred would be monitoring his students' progress and language problems through the student management facilities within some software. To be attentive to the students with limited digital skills, and to avoid any disruption in the classroom, Fred selected those software tools that were "actually very quick and easy to learn".

Nor was Fred's use of ICT limited to his classroom. He viewed ICT as "an excellent way of extending learning" beyond classroom walls and into the students' homes. Hence, he introduced other ways in which students could practise their English at home using ICT. However, Fred had to make this activity optional as not all of his students could afford access to digital devices at home. This situation also triggered Fred to initiate "discussing ways in which we [school] could provide them with computers" to offer more equitable access for his students coming from lower socio-economic conditions.

Fred's quest for change was not restricted to his classroom and his students. He was simultaneously proactively engaged in propelling his school towards digitalisation, including

setting up the schools' digital library, Facebook presence, and YouTube channel. He set up the school intranet and uploaded audio and video files on the school network, in order to provide easy and quick access for the students and to compensate for weak internet access at the school.

In summary, this vignette presents a window into the interacting ecosystems in which Fred worked as an ESOL teacher, leader, and an agent of change with ICT in a New Zealand secondary ESOL context to support his students' individual needs and enhance their learning. These interacting ecosystems are now mapped into a global perspective using the Arena framework.

6.4.2. Fred at the centre of the Arena of Change with digital technologies framework

The world ecosphere embeds within it all of Fred's students' countries of origin, their previous schools, and their course ecosystem communities, including Fred's classroom. Fred's behaviour as a member of the keystone species of teachers in the educational ecosystems of the Arena evolved over time and varied with the behaviour of the interconnected and overlapping ecosystems mapped within the Arena in Figures 6.2. Fred was a proficient ICT user who utilised ICT tools with his students strategically, knowing how to align the tools with his pedagogy. He could be characterised as an agent of change, leading change with ICT in his school, promoting the use of ICT and stimulating others for change. He did not need to invest much time and energy into learning how to operate the tools anymore.

The sketched Arena in Figure 6.2 is centred on Fred. Considering his background as an ICT consultant, he was probably evaluating the "impact" of ICT in his classroom at the beginning of his teaching career as an ESOL teacher, to use the terms of Davis's concerns-based adoption model of four steps (Davis, 2018, p.144). Realising that ICT could be an effective tool for him to address the diversity of his students (SeSiSmSr) and their needs, he chose to integrate ICT

into his classroom. However, he only had one computer in his classroom, which was not enough considering his intentions for ICT use. The school's policies in relation to ESOL were not supportive enough in providing him with more facilities either.

Therefore, Fred decided to invest from his own salary and bring in some more devices such as a laptop, a video projector, and some relevant software, and also support the students who could provide their own devices for learning and teaching purposes. Through this practice, Fred changed the behaviour in his classroom ecosystem, moving from a teacher-centred to a more student-centred one.

The school management also started to change their position and provide Fred with more support, offering him more facilities (e.g., 12 computers and a smartboard). This opened up the possibility of the use of a range of cloud-based ICT tools, mapped in Figure 6.2 in the red oval (encircled by …… lines) representing an overlaid ecosystem of digital tools, evolving with the educational settings but independent of them. However, in doing so, he was strongly influenced by his students' previous educational background (Global schools), their parents' (Pm, Pr, Pe, Pi) socio-economic conditions, and NCEA exams. Furthermore, the school management also invited him to become more engaged with the ICT development policies and practices in the school.

Figure 6.2 maps the time that Fred had evolved into an "agent of change" (Davis, 2018, p.144), and when his concerns shifted to how ICT could be of value to the people beyond his classroom and other surrounding ecosystems including the Languages and English departments with which he was collaborating with closely. As an active leader for change with ICT in his school, Fred had considerable influence on the behaviour of other species plotted in the Arena, within and outside the school. The green oval around Fred in Figure 6.2 (encircled by - - - lines) represents the range of his influence on the ecosystems he is interacting with.

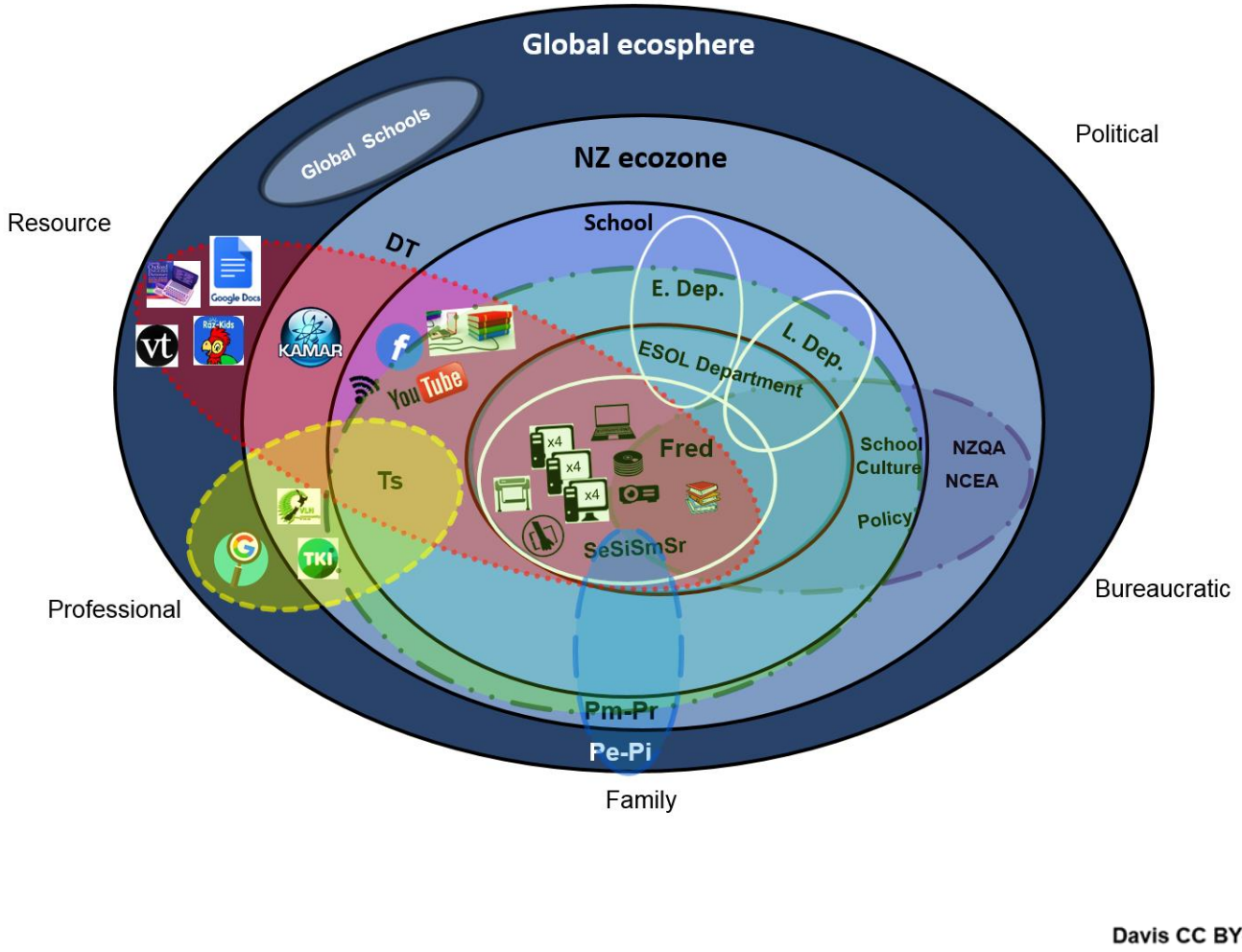

Figure 6. 2. The Arena framework with Fred, an ESOL teacher acting as an agent of change within the global ecosphere of education

Key:

 BYOD

 CD and DVDs

 Digital dictionary

 Digital library

 Facebook

 KAMAR

 Laptops

 Online resources

 PCs

 Projector

 Raz-Kids

 School Intranet

 Smartboard

 Tertiary Education

 TKI

 YouTube

 VLN

 VoiceThread

__.__.__ Bureaucratic ecosystems (Grey) …… Cloud digital tools ecosystem (Red)

__ __ __ Students' family ecosystem (Blue) ---------- Professional ecosystem (Yellow)

- - - - - - Extend of Fred's influence on surrounding ecosystems (Green)

DT, cloud digital tools; digital library; Electronic dictionaries; ESOL Department; E. Dep, English department; Facebook, Fred, teacher; GS, Schools in the global ecosphere; Intranet; KAMAR, Student management platform; NCEA, National Certificate of Educational Achievement; online resources; L. Dep., world Languages Department; Pe, exchange students' parents; Pi, international students' parents; PLD, professional learning development; Pm, migrant students' parents; Pr, refugee students' parents; Raz-Kids, a cloud-based reading software; Se, exchange students; Si, International students; Sm, migrant students; Sr, refugee students; M, school management; Policy, school policies; Smartboard, an interactive presentation tool; TKI, Ministry of Education's website, Ts, other teachers in the school.

In order to change the learning experience of the students in his school, Fred became actively involved in moving his school towards digitalisation, hence setting up the school's digital

library, Facebook page and YouTube channel. He also set up the school intranet to provide convenient, quick, and safe access to ESOL resources for his students.

As illustrated in Figure 6.2, Fred's influence extended beyond the school to have an impact on some of the students' parents (Pm, Pr, Pe, Pi) presented in blue oval (encircled by __ __ __ lines) presenting the family sector. For instance, he supported some of the students' parents who were from lower socio-economic classes to enable access to ICT for their children at home.

Fred had an additional role; he also supported his other teachers in the school (Ts) and had an impact on other ESOL teachers' professional development throughout New Zealand through his active engagement in online forums on the national TKI and VLN platforms. Being an autonomous learner, Fred also updated himself professionally by engaging in the professional ecosystem and providing support and promoting discussions. Through his interactions with colleagues and friends and available online resources, he updated his technical and pedagogical knowledge in ICT. Hence, Fred appeared to be both a distributor of knowledge at the school and national levels as well as a receiver. This mutual impact is illustrated by the overlap between the green oval and the yellow oval (encircled by ---------- lines) which represents the professional sector in Figure 6.2. Through his efforts, Fred had managed to change the school culture ecosystem, the behaviour of the management, and some of the school policies. He challenged and changed some of the policies, thus decreasing professional inequalities for ESOL teachers.

Fred presents as an example of a teacher who has worked hard to enable ICT integration in ESOL context in his school. Fred's ICT practices evolved over time as changes in one ecosystem influenced another, enabling the species in different ecosystems to work collaboratively, and less against or independent of one another in the process of change with digital technologies. Fred realised the efficiency of ICT tools in alleviating the problems

associated with the complex and diverse nature of ESOL. He used ICT to enhance students' learning outcomes and to extend learning beyond the school. He also enhanced equity, accessibility, and digital inclusion in his classroom and school as directed by the Ministry of Education in "Towards Digital Fluency" (Ministry of Education, 2015c). This occurred mainly because Fred was a leader in his environment and his concern was to be a "change agent" in the terms of Davis's (2018) concerns-based adoption model of four steps. Hence, Fred worked hard for change, took risks, and devised a variety of strategies to overcome the challenges and obstacles in his path. Furthermore, his prior experience with ICT appeared to have given him more power and confidence to believe in his proactive role with ICT. However, according to Rogers (2003), innovators and early adopters, such as Fred, who are enthusiastic about adopting innovations and new ideas and have the "highest degree of opinion leadership" (p.283) comprise only 16% of the population. The remaining 84% of the population is unlikely to have the opportunity and the enthusiasm to promote the same adoption level. Hence, similar outcomes to those achieved by Fred are unlikely to occur with other ESOL teachers and the ecosystems around them in a way that improves the conditions for ICT integration in their school ecosystem.

6.5. Amy: a versatile teacher of languages, including ESOL and of ICT

6.5.1. Vignette of Amy

In her early 50s, Amy was a versatile teacher who had been working as a teacher of Digital Technology including ICT, World Languages, and ESOL in New Zealand secondary schools for three years. The teaching diploma Amy undertook in New Zealand and her experience of living and studying abroad influenced Amy's vision of education. This experience endowed her with the understanding of what it means to study and live in a language context other than one's native tongue. This made Amy more cautious of and sympathetic towards her students'

challenging conditions and their emotions, characteristics that many of her other colleagues did not necessarily share. She considered herself a high-level ICT user both in her personal and professional life, who had witnessed "the convenience of technology straight away". She kept herself abreast of the emerging ICT tools through "self-study" and her "connections with ICT community". Her knowledge of ICT encouraged her to teach the ICT part of the Technology curriculum with an aim that her students would develop their digital literacy skills and be prepared for ICT-related careers.

Amy taught in a well-equipped "Mac school" where all the students had their own MacBook laptops. The student roll in her school was around 450, out of which five to seven percent were internationals. These students entered the school at different times during the year with diverse educational objectives, lengths of stay, domestic educational systems, linguistic backgrounds, and language proficiency. Such diversity had caused challenges for Amy's classroom pedagogy. She found it difficult to cater for both her short-term students (such as European exchange students) who attended the school for language acquisition and the experience of being overseas, and the long-term students (mainly Asian students) aiming for NCEA and university qualifications. Influences from the students' overseas educational systems was another issue. Addressing what Amy called "bad habits" that she reported the students carried over from their prior learning, this unlearning and re-learning process proved to be difficult and time-consuming.

Furthermore, since these students had not been taught many of the skills that the students in New Zealand schools had already gained, they had "a lot to catch up". Consequently, these ELLs needed to adjust to their new environment, including the use of ICT tools. In addition to her students' educational needs, Amy had to be aware of her students' affective and pastoral care needs, with many seeking refuge in their ESOL classroom as a "home". Hence, she

allocated extra time and effort to assist them in their new environment and to support them with the challenges they were facing. Other teachers' perceptions about ELLs was another challenge Amy reported that she faced. In her school, she needed to spend extra time raising awareness amongst her colleagues to reduce what she recognised as a "horrible bias that perhaps these kids [ELLs] aren't quite as bright as everyone else".

Amy recognised that teaching ESOL classes was different from teaching her world language classes (such as Japanese), and she was also cognizant of the fact that teaching English in New Zealand was "quite different to doing it overseas". This was mainly a result of the "incredibly complicated situation" of ESOL in New Zealand. Thus the ESOL class was quite different from her world language classes, which was more systematic in pedagogy, the material taught, and students' objectives and language levels.

The situation became even more complex for Amy when she decided to use CALL software with her students. This highlighted issues such as ESOL policies, students' ICT knowledge, as well as their culture and the technology itself. Blaming the "lack of any set policy on how to integrate international students on the ICT programs", she found many ELLs' lack of digital skills the first "huge challenge". For Amy, her students' perception of ICT more as a socialisation and communication tool than a learning tool was another "big problem", which also "restricted" her use of ICT. This student attitude increased the likelihood of "inappropriate use" of ICT in the classroom, and also made Amy feel responsible for "modifying their behaviour". Addressing the mistaken and fearful preconceptions of students' parents posed an additional challenge that Amy was required to address. These parents, who had mainly lived overseas in a culture where ICT was not implemented as an educational tool, were rather anxious that ICT would not only put their children at risk, but also that their children were not actually learning, but rather wasting their time on the computers.

Another challenge that Amy recognised was the relevance of ICT applications to her complex ESOL context. Although she had little problem accessing the hardware, finding an appropriate activity that suited her ELLs proved to be an obstacle. Less than satisfied with the available ICT tools for ELLs, Amy was critical of the slow evolution of more intelligent cloud-based tools, such as iCALL (Intelligent Computer Assisted Language Learning), which could better support the range of diversity in her ELLs. Searching for appropriate software proved even more cumbersome, as students "immersed" in a native English-speaking context did not necessarily have the "intrinsic motivation" to use ICT to gain the language input that such software usually provided. Even on occasions when Amy had decided to use ICT, she was wary of its compatibility with such national exams as NCEA and international ones such as IELTS, which were "all paper-based". She was concerned that being accustomed to typing, the students would have trouble sustaining writing on paper throughout the exam.

The lack of alignment of ESOL with the language curriculum and the allocation of any accreditation for students learning English as an additional language also made the situation different from any other subject in the school, including world languages. In Amy's view, this not only demotivated students but also undermined the ESOL teachers' position in the school, causing alienation and lack of motivation for professional change.

Dealing with such complex situations caused Amy to take a "completely different approach" in ESOL from her world languages classes, including the decision not to use the ICT tools. Rating her use of ICT with ELLs as "very low level", she explained she would rather expose the students to what she, as the teacher, had "done on the computer, rather than getting them to do a lot of stuff".

Despite being a firm believer in the efficiency of ICT in education, Amy did not appear inclined to play the role of a change agent herself in her school when it came to ICT. She strongly

believed that the choice of whether or not to use ICT was a professional decision requiring a "personal fit", especially since many of her colleagues were older and more experienced teachers who were successful in their pedagogy without the presence of ICT. The second reason for Amy's reluctance was the "natural disinclination or resistance" towards ICT, which she perceived in her colleagues, tracing it to factors such as the inappropriate approach to ICT integration in the schools, teachers being "overwhelmed with too much ICT", inefficient PLD workshops that mainly taught about ICT rather than its implications, and limited technical support in schools.

However, notwithstanding these complexities, Amy maintained that the presence of good leaders would "help bring other people along". Hence, she played an active role when she felt the need and received requests for support from the ESOL community. For instance, in reply to some requests from her colleagues in other schools for a shared platform, she set up a virtual community on the New Zealand schools VLN to connect the ESOL teachers in the region and to update them on the recent news in the community.

Having presented these multiple and complex influences, the next section will use the Arena framework to discuss how they interact and impact upon each other.

6.5.2. Amy at the centre of the Arena of Change with digital technologies framework

Figure 6.3 provides the ecological perspective on the complexity of change with digital technologies and the multiple interconnected ecosystems having an impact on the process of change in Amy's classroom ecosystems. Amy at the centre of the Arena, can be viewed as the teacher, in charge of three different subjects: ESOL, world languages, and ICT. Amy's behaviour as a member of the keystone species of teachers in the educational ecosystems of the Arena evolved over time, and varied in light of her students' (St, Sl, Se, Si) behaviour, as

well as other interconnected ecosystems mapped within the Arena. While she integrated ICT tools (e.g., Language Perfect, Facebook, digital media) in her other classes, she made a professional decision to limit her use of ICT tools with her ELLs.

Ranging widely in their learning objectives and needs, Amy's ESOL class students came from different educational ecosystems within a global ecosphere, and were themselves affected by the cultures that they carried from their previous schooling overseas schools (Global school culture).

In addition to Amy, parents of the ELLs were also keystone species in the home ecosystems that they inhabited, that are located under family and community sector at the bottom of the Arena oval in blue (encircled by __ __ __ lines). While Amy was supporting her students in her classroom and was responsible for the design of her ESOL class learning ecosystem (Davis, 2018), the parents were responsible for designing their learning ecosystems outside the school and at home, to support their children's well-being. However, in the case of Amy's students in her ESOL classroom, those parents who lived overseas might not have been able to fully attend to their children's needs outside the school and to provide them with the support they needed. This might create disruption in the family and community ecosystems. The common practice in New Zealand is that the international students homestay with another family. Although not reported directly by the teachers, this usually brings in an additional ecosystem to the students' lives with associated challenges and influences involved with adapting to the people, rules and cultures of a new household and, at the same time, missing family and home and the presence of parents. The homestay families are presented in a purple coloured oval (encircled by __ __ __ lines).

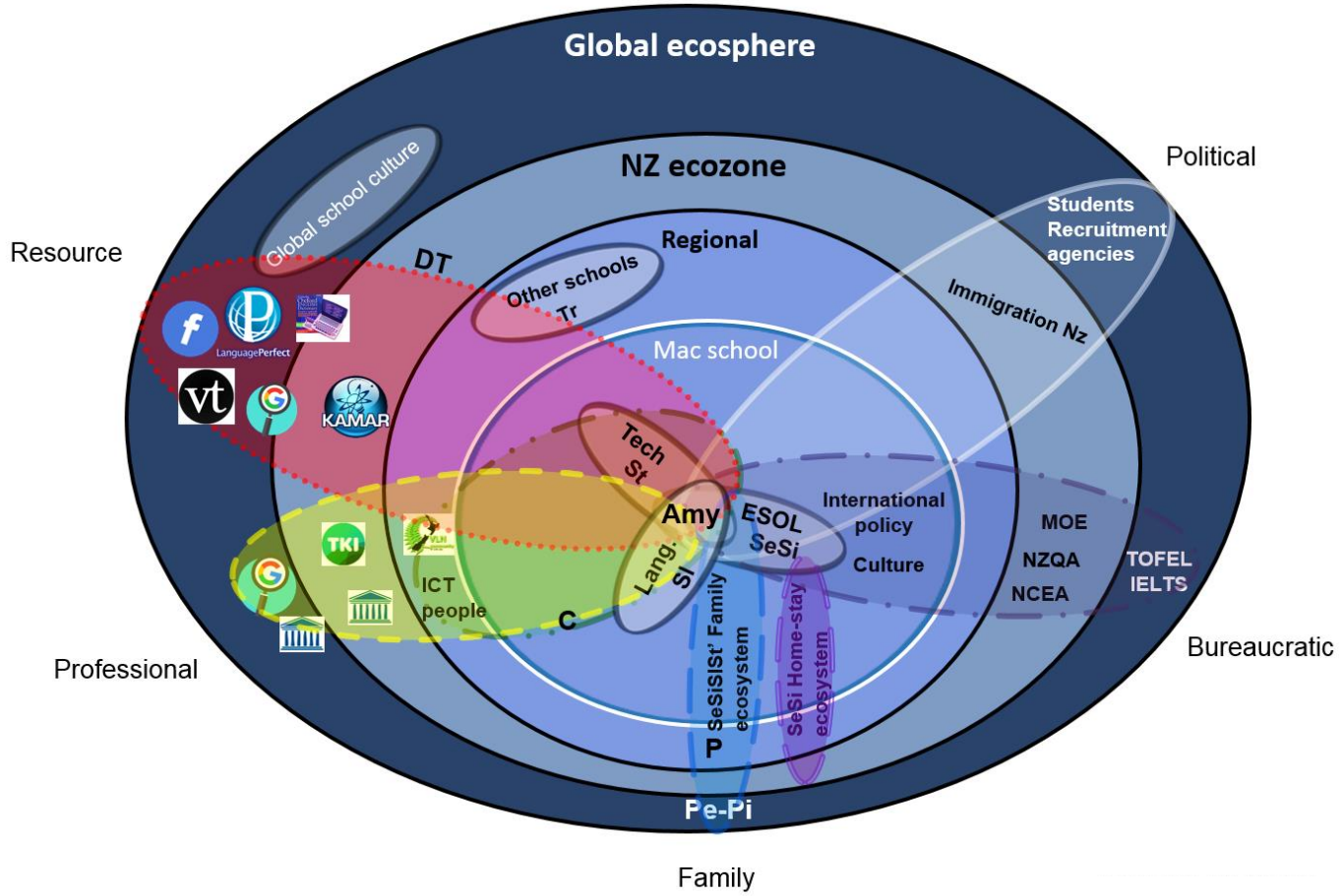

Figure 6.3. The Arena framework with Amy, a versatile teacher teaching ESOL, technology, and Languages, within the global ecosphere of education

Key:

 Digital dictionary  Facebook  KAMAR  Language Perfect

 Online resources  Tertiary Education  TKI  VLN

 VoiceThread

__.__.__ Bureaucratic ecosystems (Grey) …… Cloud digital tools ecosystem (Red)

__ _ __ SeSiSlSt family ecosystem (Blue) __ __ __ SeSi homestay ecosystem (Purple)

- - - - - - Extend of Amy's influence on surrounding ecosystems (Green) ---------- Professional ecosystem (Yellow)

C, Colleagues in the school; DT, cloud-based digital tools; Global schools, Schools in the global ecosphere; IELTS, International English Language Testing System; Immigration New Zealand; International students' recruitment agencies; ICT community, professionals in ICT; Amy, the teacher; MOE, Ministry of Education; NCEA, National Certificate of Educational Achievement; NZQA, the New Zealand Qualification Authority; Online resources, cloud-based information; Other schools, New Zealand secondary schools in the regional layer; Pe, exchange students' parents; Pi, international students' parents; Pm, migrant students' parents; PLD, professional learning development; Pr, students' parents residing in the region; Se, exchange students; Si, International students; School international policies; Sl, Languages students; St, technology students; Tertiary education; TKI, Ministry of Education's website; TOEFL, Test of English as a Foreign Language; Tr, teachers in the region; University, tertiary education; VLN, ESOL Virtual Learning Networks; Vt, VoiceThread.

Hence, Amy had to intervene and address such disruptions through developing a strategy that accommodated her students' affective needs. Furthermore, some of the parents (PePi) belonged to cultures in which technology was not utilised as an educational tool and, as such, they might be reluctant towards the uses of ICT in educational contexts, being concerned with the efficacy of this approach.

The influence of the professional ecosystem presented in the yellow oval (with ------- lines around) in the Arena on the bottom left of Figure 6.3, ranged from in-school PLD opportunities to such wider contexts as regional ESOL cluster meetings, VLN groups, the ICT community, and the national and international tertiary education. However, Amy preferred not to apply ICT in her ESOL teaching context. This is shown in the Arena through the limited overlapping of the professional ecosystem with ICT in Amy's ESOL classroom.

The extent of the spread of the green oval around Amy indicates that unlike Fred, she did not appear to have a great influence on her surrounding ecosystems. Amy's behaviour towards change in the ecosystems she was involved in was influenced by her colleagues' (C) lack of enthusiasm and by requests for change with ICT in the school and out of school at the wider regional (Tr) layer. Amy's colleagues' lack of enthusiasm appeared to have originated from their sense of being overwhelmed by the range of influences on the teachers in their schools in the region (other schools). In addition, other bureaucracies enacted through the Ministry of Education (bureaucratic ecosystem in a grey oval encircled by _._._lines) affected the position of ESOL in the New Zealand Curriculum (Ministry of Education, 2007), and the procedures ESOL teachers were required to undertake (Ministry of Education, 2017a). Although Amy's school was a "Mac school", and she had access to sufficient technologies (hard and software) in her classroom, she was not able to take full advantage of these facilities. First, she was critical of the slow rate of the evolution of cloud-based applications relevant to ESOL classrooms compared to other disciplines. This is represented in Figure 6.3 by the red oval illustrating a cloud-based ecosystem lying across other classroom ecosystems but only minimally over ESOL. Secondly, Amy reported that she chose not to use much ICT in her ESOL teaching due to her understanding of the needs of her ELLs.

The bureaucratic ecosystem, including the national assessment NCEA requirements, the exam bodies at national level supervising the assessment (NZQA) and international organisations providing English language tests, such as IELTS and their policies, regulations, and restrictions on computer-based testing could all influence the school cultures, Amy's practice and her students' needs. Since Amy's ELLs were mainly international, preparing them for the mainly paper-based standardised English language proficiency tests was crucial. However, this sector appeared to have been slow in co-evolving with changes with ICT in education. The Political ecosystem, illustrated in white at the top right corner of the Arena shown in Figure 6.3, including the student recruitment agencies and Immigration New Zealand, could also cause an imbalance in the ESOL classroom ecosystem by encouraging students to arrive at different time of the year.

Amy is an example of a teacher who, despite her almost comprehensive knowledge of ICT and its integration in the other disciplines she taught, made a deliberate decision not to use those applications in her ESOL classroom; the complexity of her ESOL context was perhaps the main reason for her decision. She was not an agent of change and did little to stimulate, encourage and motivate change with ICT in her school ecosystems. In her view, she believed that teachers are already overburdened with the amount of change imposed on them in their technology-rich school.

Amy represented a versatile, techno-savvy teacher, who was both an "affirmer" and a "rejecter" of ICT depending on her context dependent on what she was teaching and its "impact" (Davis, 2018, p. 143). She was an exceptional case who represented a low level of ICT use in her ESOL classroom, but a high level of enthusiasm and use in other disciplines she taught. Although she claimed to be confident with ICT, she did not take on any leadership role in creating change around her, and it appeared that her surrounding ecosystems had great influence on her professional decision making and practice. She appeared to be mindful of her students' and

colleagues' needs in her professional environment and tried to use ICT only when she perceived it to be really necessary and truly sought and appreciated.

6.6. Conclusion and the way forward

This chapter provided a holistic picture of the processes involved in change with ICT tools in three different ESOL secondary school contexts in New Zealand. The Arena framework provided the means to map influences within various ecosystems that had an impact on these three ESOL teachers' ICT use and integration. This provided a deeper analysis and better understanding of the ecosystems within which the ESOL teachers live and the layers of ecosystems that interact.

The analyses of the three vignettes showed that each ESOL class ecosystem was complex, different, and dynamic, and that changes within these ecosystems were influenced by interactions with a large number of other ecosystems, locally, nationally, and globally. Each teacher's behaviour and their concerns as a member of the keystone sub-species (ESOL teachers) evolved and co-evolved over time and varied in accordance with the changes in their ecosystems. Individual classroom ICT practices were influenced by living and non-living matter in many interacting ecosystems. These factors included, but were not limited to, teachers' preferences; students' needs; the school culture; the increasing range of cloud-based ICT tools evolving in their own ecosystems and coevolving within their educational environments; the potential relevance of these tools to the ESOL context; the rate of evolution including the coevolution of professional ecosystems in relation to ESOL as a discipline; the availability of resources; and bureaucratic demands.

Given these complexities, sustainable change in ESOL teachers' ICT practices appears to involve coherence with the manner in which ecosystems were working and co-evolving with one another. It also involved considerable ongoing effort from each of the teachers and support from their

schools and communities. Under such circumstances, in order to maintain balance within such complex ecosystems, the individual ESOL teachers evolved differently and adopted different approaches in their pedagogy.

For instance, Jean, as a part-time teacher, was working hard to support her students with their language development and did her best to keep herself abreast of language teaching pedagogies and CALL. However, she found the constant introduction of various ICT tools from the school management and their constant evolution challenging. This was particularly because, unlike another teacher Fred, she neither had the support from the management nor the technical know-how to be an autonomous learner. Lack of availability of ESOL colleagues who could help her made her situation even more difficult. Hence, lack of coherence in the ecosystems within which she was living placed extra pressure on Jean and consequently marginalised her to the extent that at some point she almost gave up on updating herself in relation to ICT. This could have led to her leaving the educational system, despite her valuable teaching experience. On the contrary, Fred went out of his way to compensate for the lack of coherence in his system by integrating ICT into his classroom ecosystem and school ecosystem prompting the behaviour of his school management to evolve in a way that supported Fred to adopt more ICT. The school managers did their best to restore coherence to their ecosystems, so much so that they considered providing laptops for the students who could not afford one.

The final contrast was Amy, who reported a contrasting behaviour despite her valuable ICT skills, second language pedagogical knowledge, and good school facilities. She made a professional decision to take a step back and not to use ICT in her ESOL classroom because she perceived the lack of coherence with other ecosystems, such as how her colleagues were behaving towards ESOL students and limited availability of digital resources relevant to her ESOL students. This could have been redressed if her other ESOL colleagues had been interested in developing and

sharing teacher developed materials. For example, when Amy started a VLN group in her region, she saw the coherence with those teachers' interests. However, both her ESOL and non-ESOL colleagues in her school did not seem to be keen to engage with ICT, which made Amy reluctant to offer her ICT knowledge.

The use of the Arena supported the complex analysis of the data presented in these three vignettes. By providing a holistic picture and mapping the various interacting influencing ecosystems stretched over local, national, and global layers, the Arena framework may also help others (teachers, secondary school leaders, as well as policy-makers and technical service providers) to understand the complexity involved in changes of teachers' behaviour with ICT. Such holistic approach to analysis through mapping in the layered ecosystems can help to improve interpretation and occasionally predict the patterns of change in the teachers' behaviour. Along with discussion of the literature, the ways in which this might be done will be discussed in the next chapter.

Chapter Seven
Discussion and Conclusion

7.1. Introduction

This chapter discusses and synthesises the findings about selected New Zealand secondary school ESOL teachers' reported ICT practices, the perceived influences on their practices, and the relations and interrelations between the influences. Following a brief summary of the key findings and their contribution to the literature, the findings are discussed in relation to literature. Guided by the structure of the thesis and Davis's (2018) Arena framework, the discussion of the findings is organised in three subsections moving from a focus on the teacher in the ecosystem of the ESOL class outwards to the widest global perspective. The implications of the study are then presented according to the audience addressed, starting with ESOL teachers. This is followed by a description of the limitations before the final remarks that conclude this thesis.

7.2. Summary of the key findings and their contribution to the literature

This section provides a summary of the key findings and presents the contributions they make to the literature, i.e., whether they confirm the existing literature, extend it, or are original findings. It presents the most detailed accounts of the surprising range and complexity of ICT practices reported by a number of ESOL teachers in Aotearoa New Zealand. The broad spectrum of teachers' practices was clear from the contrast between Jean's and Fred's ICT practices in their ESOL classroom, ranging from almost no pedagogical use (Jean) to total dependence (Fred) (see Chapter Six). It is also useful to note that all 21 of the participating ESOL teachers reported that they made some use of ICT tools in their professional life.

This study is original in the sense that it is the only study which has adopted Nation's (2007) pedagogical principles to classify the ICT tools reported to be employed by ESOL teachers based

on their pedagogical purposes in ESOL classrooms. Nation's (2007) pedagogical principles were found to be a suitable tool to analyse teachers' ICT practices. This also indicates that the principles can guide ESOL teachers to systematically and purposefully integrate ICT into their pedagogy. However, due to its limitations and despite its popularity (Hamilton et al., 2016; Hilton, 2016), the SAMR model needed to be applied with more care when interpreting the findings, which involved taking into consideration the teachers' teaching contexts as well as the ICT tools used.

Davis's (2010) synthesis of the concerns-based models was found to be a useful analysis tool to identify the teachers' concerns during their ICT uptake and use. This is one of the first analysis reports of ESOL teachers' concerns-based adoption of ICT, and the first analysis in New Zealand. Although the findings confirms the existing literature on the importance of the teachers' willingness to change on their ICT uptake and use, it also expands it by illustrating that a teacher's behaviour is strongly driven by their concerns. For example, some ESOL teachers' concerns about "self" (Davis, 2018, p143) were expressed by their low computer self-efficacy beliefs and the fear of losing face (e.g., Jean). Many teachers reported concerns about "task" (Davis, 2018) and how they could integrate ICT effectively into their practice (e.g., Heather). Given the special conditions of ESOL classrooms and the variety of ELLs' needs, most teachers expressed reservations about the "impact" (Davis, 2018) and suitability of ICT tools on their ELLs (e.g., Amy). However, there were a few teachers who advocated for the use of ICT and attempted to promote and encourage ICT integration and, as such, were considered agents of change (e.g., Fred).

This study confirms the existing literature on the importance of sufficient infrastructure and resources, and adds further details on ICT resource issues for New Zealand secondary ESOL teachers. Teachers reported having access to ICT tools through one or more of five means:

teacher laptops (TELA), fixed computers in the classroom, computer labs, Computers on Wheels (COWs), and Bring Your Own Device (BYOD). However, each one of these means of accessing ICT has its own limitations.

The impact of the complexity of ELLs' pastoral, educational, and emotional needs on the teachers' ICT practices in the classroom has not been previously researched in such depth in the New Zealand context. ELLs come from overseas and carry strong influences from their previous environments. Against this backdrop, ESOL teachers' responsibilities exceed that of a mere language teacher because they needed to address the wide range of social, emotional, educational, cultural, and economic needs of their ELLs, which are shaped by both local and global factors. In addition, the low socio-economic condition of some of the ELLs and their lack of access to ICT further add to the complexities concerning BYOD policy in the classroom. This is an original finding as the complexity of BYOD policy for ESOL teachers has not been appreciated in this depth before. These findings also expand the knowledge of ESOL contexts by elaborating on the complexities involved in teaching ESOL in secondary school contexts compared to other English teaching contexts such as language institutes.

This study sheds light on ESOL teachers' particular challenges, needs, and concerns in both initial teacher education and ongoing in-service teacher professional learning and development (PLD). The ESOL teachers' reports of ICT in initial teacher education and ICTPLD also provide new insights into the New Zealand context. The experts and ESOL teachers reported very little access to formal PLD related to ESOL, particularly in CALL. ESOL teachers reported a clear preference for more informal forms of learning as the most convenient and relevant type of learning. For example, the effectiveness of such support was acknowledged by Sue, who considered herself "lucky" to be in a department with seven other ESOL colleagues, from whom she could seek immediate and situated support (see Chapter Five).

Finally, the study supports the critique of curriculum reform and the lack of any clear position and framework for ESOL (Franken & Smith, 2006). All the participating teachers reported that they sought more recognition and found it a challenge for their voice and those of their ELLs to be heard.

Overall, the findings of the study indicate that change with ICT in ESOL classrooms is a complex and challenging process. The variety of challenges and complexities of this co-evolution were contrasted with three ESOL teachers mapped in the Arena framework (Davis, 2018). Each ESOL class ecosystem is complex and different from other ecosystems locally, nationally, and globally. The integration of ICT in such complex contexts requires coherence between different ecosystems, great effort from the teachers, and support from their schools and communities. This finding was illustrated through mapping Jean, Fred, and Amy, whose behaviour as a member of the keystone species of teachers in the educational ecosystems of the Arena evolved over time and varied with changes in interacting ecosystems:

1. Jean was eager to use ICT but was challenged by limited support for ICT PLD and the needs of her ELLs who had low levels of English.
2. Fred, despite the challenges he encountered, chose to use and introduce more ICT in his context.
3. Amy made a professional decision to not use ICT with her ELLs despite her extensive use of ICT when teaching other students in her school

These findings are original as it is the first time that such a holistic view of an ESOL ecosystem is presented through Davis's Arena framework with ESOL teachers at the centre of the global Arena.

7.3. Discussion of the key findings

Although there is a plethora of literature on the factors that influence teachers' ICT practices in various educational settings and across different disciplines, this study extends the existing literature by focusing on a particular discipline (i.e., ESOL), within a specific context (New Zealand secondary schools). Influenced by a wide range of ecosystems, the findings indicate that New Zealand secondary school ESOL ecosystem is very complex and such complexity adds to the challenges for the integration of ICT. An ESOL teacher's behaviour evolves over time and varies with the behaviour of the interacting ecosystems. Attention to such complexity in relation to the influences within interacting ecosystems as a whole, and in relation to ICT integration in content-based ESOL ecosystems has rarely been addressed in the literature before. Hence, in the following, the findings on teachers' reported uses of ICT tools and how such practice was influenced by various ecosystems is discussed in relation to the literature.

7.3.1. Issues of classroom pedagogy and teachers' ICT practices

As discussed earlier in the literature, various researchers, such as Warschauer (1998), Bax (2003), and Nunan (2010) have tried to offer their own classification of the roles of ICT in a language classroom. However, none of these classifications were based on language learning classroom pedagogy. Although not directly related to ICT, Nation's (2007) set of pedagogical principles for language teachers was then considered to classify and analyse ICT tools based on their pedagogical functions. Nation (2007) suggests that his principles can be used to help teachers keep the balance in their pedagogy with the introduction of an innovation.

The successful alignment of Nation's pedagogical principles with the ESOL teachers' ICT practices indicates that it is a suitable tool for both guiding and assessing purposes. For instance, Nation's pedagogical principles provide insights into to the unique nature of content-based ESOL contexts. They explain why ESOL teachers can better address all of Nation's pedagogical

principles when supported by other teachers (see Section 4. 2. 11). Hence, Nation's pedagogical principles can be suggested as a tool to address the gap in the literature for an activity type taxonomy through which the pedagogical functions and practical applications of ICT tools in second language classrooms can be analysed (see Sections 2.3 and 2.5.1).

The findings suggest taking precautions when using and interpreting SAMR (Puentedura, 2013) when it is used to evaluate ESOL teachers' level of their e-maturity with ICT tools. SAMR does not take account of the affordances of the ICT itself in relation to the wider context in which ICT is used and the techno-centric nature of this model can distract from more relevant aspects of language learning or pastoral support (e.g., Amy). Critiques of the techno-centric nature of such e-maturity models have also previously highlighted the deficiency of such models in the literature (Davis, 2018; Hamilton et al., 2016; Hilton, 2016). For instance, the staged layout in SAMR can be particularly problematic because SAMR frames the redefinition stage as the ultimate goal in the application of an ICT tool. However, some ICT tools used in an ESOL context, such as digital dictionaries, have only evolved to be used at the augmentation stage, and there are occasions where the use of ICT in redefinition stage may be less beneficial for the ELLs. More importantly, SAMR ignores the multi-directional nature of change. Change with digital technologies in education is multi-directional and cannot fit within a single "maturity matrix" (Davis, 2018, p.79). This is because digital tools evolve and co-evolve with time, hence making change an "ongoing evolutionary process" which varies across different contexts (Davis, 2018, p.78).

7.3.2. Professional ecosystems: Teacher knowledge and teacher learning

The use of Nation's (2007) second language classroom pedagogies and Puentedura's (2013) SAMR model as analytical tools provided various insights into ESOL teachers' reported ICT practices. One important insight in relation to teachers' ICT practices was that, in addition to

identifying the pedagogical applications of ICT into ESOL classrooms, it was revealed that the teachers varied widely in these ICT practices.

In relation to teachers' professional ecosystems, the findings are more detailed than previous studies and they include personal and professional influences on teachers' ICT practices, including teachers' personal characteristics and the availability of relevant ICTPLD opportunities for ESOL teachers in New Zealand.

The variation between the teachers in their willingness to learn about change with ICT was identified as one of the key influences in teachers' adoption and/or rejection of ICT tools. This confirms the findings of previous researchers, such as Eekelen, Vermunt, and Boshuizen (2006), who drew attention to the importance of "a will to learn" as a prerequisite for teacher engagement in actual learning activities (p. 408). They identified a range of behaviours that a person with a will to learn should possess, i.e., "having the ambition to discover new practices, being open to experiences and other people, being pro-active, question-asking after performance, undertaking action to learn, and recognition of learning processes and findings" (p. 408). Similarly, Knezek and Christensen (2016) identify teachers' willingness to learn as one of the four main independent components in their model of technology integration. Willingness to learn forms a positive behavioural intention which helps the teachers to be accepting, flexible, and tolerant of change, whereas resistance forms a negative behavioural intention that hinders teachers' inclination towards ICT adoption and use. In this study, although the lack of willingness to change with ICT appeared to be more frequent in older teachers, Fred was the most extreme example of an older teacher who in addition to having a will to learn, he had high levels of computer self-efficacy beliefs and concerns for change. The study, therefore, extends research supporting the relevance of teachers' computer self-efficacy beliefs to apply to ESOL teachers in New Zealand.

Akyol (2016) reports on the positive relation between teachers' self-efficacy perceptions and their tendency to be lifelong learners. However, as illustrated by Fred, who did a lot of self-learning in ICT, when the focus was on change with ICT in education there was an additional criterion, namely teachers' computer self-efficacy. These findings are in close alignment with other studies that have found a strong connection between the teachers' computer self-efficacy beliefs and their ICT integration in educational contexts (Compeau & Higgins, 1995; Yeşilyurt, Ulaş, & Akan, 2016).

In addition, the findings of the study appear to suggest a close connection between the teachers' self-efficacy beliefs and the people with whom they interact. This is illustrated when some of the older teachers with lower computer self-efficacy expressed their feelings of disappointment because of their constant failure in their ICT learning and use, especially when they compared themselves to their younger and more successful colleagues during the PLD sessions. These teachers' judgements about their ageing process and its side effects such as slower learning pace, difficulty in unlearning old habits, relearning new ones, and reduced rate of recall appeared to further influence older teachers' computer self-efficacy beliefs.

This finding confirm Compeau and Higgins (1995) and Bandura's (1997) seminal work, which describe teachers' personal performance accomplishments, observation of success and failure of self and others, persuasion received from others, and mental, emotional, and physiological states as influential on a person's self-efficacy beliefs. Bandura (1994) explains the impact of other people's behaviour on older individuals' level of self-efficacy beliefs. He argues that older individuals' act of comparing their capabilities against the younger cohorts would reduce their self-efficacy perception. According to Bandura (1994), the learning process and the performance of memory tend to influence older individuals' judgements and perceptions of their intellectual capabilities and their self-efficacy beliefs. The opposite of this behaviour was revealed amongst

the younger teachers in this study. Although some of the younger teachers, such as Sophie who reported making little use of ICT in their teaching yet had high computer self-efficacy beliefs and was confident that she and others of the same generation knew the basics and could easily upskill themselves if required.

Consequently, when professional learning is concerned, the ESOL teachers reported on the influence of availability of suitable, relevant, and situated learning opportunities on their ICT practices. Many scholars have noted that a teacher's TPACK knowledge is a kind of knowledge that takes into account the knowledge of technology, pedagogy, and content and that this is of critical importance in teacher's ICT uptake and use (Brinkerhoff, 2006; Kessler, 2007; Mueller, Wood, Willoughby, Ross, & Specht, 2008; Plair, 2008; Sandholtz & Reilly, 2004). This study extends that view, providing details of ESOL teachers' TPACK knowledge as it is co-constructed through different forms of learning, both formal and informal forms of learning. In addition, the limited presence of ICT in teacher preparation courses in formal TESOL programmes which has been recognised globally (D. Freeman, 2001; Kessler, 2006; Robb, 2006) is confirmed in this study.

The ESOL teachers gained knowledge through formal forms of learning opportunities such as ITE programs, in-service Professional Learning Development (PLD) workshops, and teaching-as-inquiry research projects. These programmes are characterised as purposefully planned and usually take place in the universities, schools, or other educational institutions. However, ITE for ESOL teachers is more complex. As illustrated in the participants' demography (see Chapter Three), the majority of the ESOL teachers in this study chose to become ESOL teachers after they had been teachers in other disciplines so they had limited or no formal qualifications or experience of teaching English as an additional language, in general, or CALL in particular. According to Franken and McComish (2003), less than 50% of such ESOL teachers hold a

specialised qualification in ESOL. Therefore, the of lack of participation of New Zealand ESOL teachers in pre-service teacher training programmes makes the importance of in-service PLD for ESOL, in general, and CALL in ESOL even more relevant.

The participants in this study (including reports of the teachers and of expert teacher educators) evaluated the PLD workshops in New Zealand as deficient in terms of relevance to ESOL pedagogy and attention to ICT. Even with the available PLD, both teachers and experts reported valid concerns over issues such as relevance to ESOL pedagogy, pace of instruction, and the quality of instruction in ICTPLD.

The need for a more specialised PLD, rather than a one-size-fits-all model, has also been pointed out in the New Zealand context by earlier studies, such as L. Ward (2003). Several studies found that high-quality and specialised teacher PLD programmes can motivate and help teachers to become aware of different ways of implementing ICT into their profession, whereas programmes irrelevant to the classroom context can demotivate teachers from attending PLD sessions (Mouza, 2009; Wells, 2007). Cowie, Jones, and Harlow (2010) identified that generic and whole-staff PLD programmes in New Zealand secondary schools are valuable for skill development in "institutionalised activities such as reporting, absences and data entry as a means of ensuring that consistency was maintained", but appeared to "lack immediacy and personal relevance" for teachers (p. 45). Similarly, Lai and Pratt's (2007) study on teachers' ICT use in 26 secondary schools in New Zealand concluded with this final statement: "The most obvious effects did not include changes in teaching philosophy or pedagogy but rather increased the efficiency of management and administration of teaching, including lesson preparation and presentation" (p. 95).

To this end, the generic nature of in-school PLD, the pace of instruction, relevance, and limited situated support during and after ICTPLDs left a niche open for the evolution of ESOL-related PLDs organised outside the school formal programmes, hence making the informal forms of learning a more desirable choice for ESOL teachers.

The current study thus confirms that informal forms of professional development appeared to have a major role in ESOL teachers' professional development due to their availability, diversity, situatedness, and individualised nature. The ESOL teachers in this study used informal individualised support and interactions with their techno-savvy colleagues, technicians, family members, friends, and online resources to compensate for the limitations of formal forms of learning. Kessler (2007) emphasises the prevalence of teacher learning through connections with peers and various online resources and forums over more formalised forms of learning. Informal forms of learning were reported as important by the teachers as they provide situated ICT support for the teachers. It is worth mentioning that, although the teachers who felt most vulnerable with regards to digital tools, such as Jean, were quite supportive of peer mentoring and perceived it as a very useful ICTPLD method, they were also cautious about whom they approached as mentors and when. Accordingly, they were inclined to approach only a few mentors with whom they felt really comfortable. Other researchers have also found that lack of a situated support structure causes frustration and disappointment for teachers and may slow down the ICT uptake process (Buabeng-Andoh, 2012; Marwan, 2008; Pelgrum, 2001; Tamo, 2014; Tong & Trinidad, 2005). There is a growing body of research on the efficacy of technical mentors' presence in enabling technology uptake of the mentees and enhancing technology users' confidence with using ICT in different contexts (Pamuk & Thompson, 2009; Silva, Correia, & Pardo-Ballester, 2010; Woodley, Burgess, Paguio, & Bingley, 2015). Although Davis (2018) warns against a major drawback of this approach, in that it may "disrupt the work of colleagues and their students" (p.

93), “collegial help” was found to be the “preferred and most prevalent form of professional development” by New Zealand secondary teachers in a study by Cowie et al. (2008, p. 40), who suggested that more provisions be made for “in-school peer mentoring” (p.52). Family and friends were also cited by some participants in this study as important sources of support and information. Although these sources may not necessarily be able to help the teachers with their TPACK, since it is a form of a specialised knowledge, they were specifically beneficial to older teachers who found more ease and comfort in resolving their technology-related problems with the extra support they could receive from family members and close friends. The positive impact of family support in helping older adults in their learning and improving their computer self-efficacy beliefs has also been recognised by Chu (2010).

Online resources such as the Ministry of Education’s web portals and language-related websites and weblogs were other sources through which teachers in this study reported to use to become aware of different possibilities of ICT integration. However, the volume of emails and information received from these online channels and the overwhelming amount and variability of information made the selection cumbersome for some of the teachers such as Jean. From among the three teachers discussed in the vignettes in Chapter Six, Fred and Amy were leaders with high computer self-efficacy beliefs who were able to make use of such resources. Davis (2018) argues that the sequenced one-way flow of such mass-produced resources, and the vague relationship between such information and a teacher’s own pedagogy and discipline, on the one hand, and the constant need for support of less digitally skilled teachers, on the other, reduce the efficacy of such resources for teachers.

In summary, as far as professional learning and development for ESOL teachers is concerned, the findings of this study align with D. Freeman and Richards' (1996) view of second language

teacher PLD as a "complex, socially constructed, developmental process in which formal professional education plays only one small part" (p.65).

7.3.3. The ecosystem of an ESOL classroom: Issues with classroom complexity and diversity

Drawing on existing literature, Perez and Morrison (2016) emphasise the need for attending to the unusual range of challenges that impact the academic progress of ELLs in K-12 schools in the United States. Such conditions placed ESOL teachers in different roles compared to other teachers in their schools. This has also been identified by Farrell (2011) who argues that, in addition to the other roles common among all teachers such as teacher as manager and teacher as professional, teachers of English as a second language assume the additional role of the teacher as "acculturator", which is unique to their context. Farrell further elaborates on this role as one that positions the teachers of English as a second language as "motherly" and as a "social worker" (p. 60). The findings from this study confirm such approach towards the roles of ESOL teachers in New Zealand since the ESOL teachers perceived their role as more than that of a mere language teacher, but someone who needs to address ESOL students' affective needs and pastoral needs in addition to the students' educational needs.

The participants reported that ELLs often experienced feelings of isolation and rejection by their mainstream peers and teachers of other subjects and on many occasions these students sought refuge with their ESOL teacher. In New Zealand, researchers exploring the feelings of ELLs have found that such factors as language, lifestyle, personal values, and culture impede the process of inter-cultural friendship for some international students and isolate them from mainstream students (McGrath & Butcher, 2004; Sawir, Marginson, Nyland, Ramia, & Rawlings-Sanaei, 2009; C. Ward & Masgoret, 2004). The OECD (2018) reports that around 70% of the students from migrant and refugee backgrounds feel that they are being treated unfairly by

their teachers. In such situations, while feelings of friendliness and congeniality from their environment can help to create a positive impact on ELLs, feelings of isolation, alienation, and discrimination could cause irreparable damage (Butcher & McGrath, 2004). McGrath and Butcher (2004) argue that "New Zealanders are generally perceived as unfriendly to international students" (p. 25), hence the attention to students' affective and pastoral needs is a particularly valid concern for New Zealand ESOL teachers. Similar cases were reported by researchers in ESOL contexts in other countries in which the students felt subordinated, devalued, and vulnerable at school (Miller & Endo, 2004a; Ogbu, 2004). Some studies indicated that ignoring this aspect of students' needs may result in aggression (Kam & Lazarevic, 2014) and, in more extreme cases, even suicidal behaviours (Rishel & Miller, 2017). In such conditions the ESOL classroom can play an important role in ELLs' life. Research indicates that being with only ELLs in ESOL classrooms enables ESOL students to develop a sense of belonging amongst themselves, which makes them feel more emotionally secure and motivated to learn (Rjosk, Richter, Hochweber, Lüdtke, & Stanat, 2015; Wang & Eccles, 2013). Given the situation of ELLs and the importance of providing support for them, the ESOL teachers in this study appeared to have prioritised offering more socio-emotional and affective support in their classroom pedagogy, so that they could create an environment to better support their students. Being well aware of such emotions, the ESOL teachers in this study felt that their students expected them to spend more face-to-face time and have closer interaction with them since, for ELLs, the ESOL classrooms were regarded as a site where they could overcome such feelings to feel more relaxed and at home.

In addition to providing affective support, the ESOL teachers felt additional responsibilities as they had to teach their students not only the language, but also help them in learning their mainstream subjects. They believed that the ELLs were not receiving the required academic

support from their teachers in their mainstream classes, so that this remained the responsibility of the ESOL teacher. In addition, the ELLs' language learning goals varied with some aiming for general English and some for academic English, as well as with the mainstream subjects where they need help. A study by Edwards (2014) also confirms the ESOL teachers' concern regarding their ELLs' academic achievement. His study indicates that in New Zealand the mainstream teachers believed that their knowledge of second language pedagogy for supporting the ELLs in their mainstream subjects was limited and they were not fully aware of how to support their ELLs.

ELLs' previous schooling and cultural background was another influence reported to impact on the ESOL teachers' elected pedagogy and practice. The ELLs often came from home country schools which are different in their values, pedagogical approaches, and cultures. In many of these countries ICT has not yet been integrated into schools, and the teaching approach is still to a large extent teacher centred. Hence, the ESOL teachers believed that they had to adopt a type of pedagogy that suited the ELLs' previous pedagogy, learning styles, and cultures. Providing the ELLs with culturally familiar and personally relevant learning material is believed to increase the ELLs' level of engagement and learning (Peterson & Heywood, 2007). This study confirms the previous literature as Ogbu (1988) and Barnard (1998) describe a similar situation at a public school in New Zealand where the ELLs brought into their classrooms their community cultures, pedagogies, and learning styles with which they were familiar and the teachers were required to adjust their pedagogy. While the impact of the range of students' cultures on teachers' pedagogy has been previously recognised, the ways in which it impacted ESOL teachers in New Zealand ICT integration practices with their students had little previous research. This study also extends research by clarifying that attending to such wide range of diversity of students' needs required

the preparation of individualised course material for their students, which is a tedious and time-consuming process.

Concerning the kind of the skills that ELLs need to master, the existing literature acknowledged the "extra learning burden" for ELLs compared with their L1 English speaking peers (Franken & McComish, 2003, p. 30) in relation to the reading, writing, English language skills, and numeracy skills, but less attention has been paid to ICT skills. This study extends these findings to suggest that much more attention needs to be devoted to the ELLs' ICT skills. The ESOL teachers in this study reported that, given students' low language level and lack of familiarity with ICT, improving their ICT skills entailed considerable time, energy, and effort. In addition, these teachers reported finding themselves challenged because of their students' perceptions of ICT tools. Highlighting a similar concern, Lam (2000) has argued that ELLs' backgrounds and their previous exposure to technology influenced teachers to modify the manner in which they used ICT because some of their ELLs either did not have sufficient technical knowledge or often felt intimidated by the ICT due to the background and the culture from which they came. Other studies have also confirmed the importance of the students' attitude and mental readiness as well as their digital skills on the use of technology in the classroom (Horzum, Ozturk, Bektas, Gungoren, & Cakir, 2014; Shin & Son, 2007).

This study also confirms the complexity of ELLs' access to ICT and its relationship with their parents' attitudes towards ICT, their socio-economic conditions and their culture and extends it to ESOL teachers' reported ICT practices in New Zealand. The ESOL teachers reported that they were challenged by the perceptions of some of the ELLs' parents towards ICT, particularly when it involved BYOD policy. This issue has been recognised amongst pre-service Chinese language teachers by H. Liu et al. (2017), who reported that some of the language learners' parents' reluctance towards the use of ICT with their children was found to have inhibited those ESOL

teachers' ICT use and integration. Parsons and Adhikari's (2016) study on the perceptions of teachers, students, and parents to BYOD policy in a secondary school in New Zealand reports concerns over the increasing digital divide between the students and their parents, which appears to arise from the parents' feelings of alienation due to their own limited ICT skills, their unfamiliarity with such modes of learning, or their low socio-economic conditions. Other studies have also documented similar impacts of family socio-economic status, culture, and ethnicity (Engin-Demir, 2009; Okioga, 2013).

In summary, influenced by their students' diversity in their emotional and educational needs, individual ESOL teachers adopted very different approaches towards ICT integration with their students. This was detailed in the case of the three teachers presented as vignettes in Chapter Six. For instance, due to her students' needs and backgrounds and despite her use of ICT in her other world languages classes, Amy made a professional decision to avoid the use of CALL programs with her ELLs. Similarly, one of the reasons Jean was wary of using ICT was her students' limited ICT and language skills. In contrast, Fred chose a different approach and used technology to address the complexity of his context and the diversity of his students. ICT tools supported him in providing personalised and culturally responsive pedagogy for his ELLs. Investigating the impact of the ELLs' individual needs and abilities on the individual teachers' behaviour and their decision for ICT integration in an ESOL classroom in such depth is an original finding. This study provides evidence that D. Freeman's (2001) claim remains pertinent almost a decade later: "in many contexts, ESOL instruction is becoming more complex and demanding as schools admit learners who are linguistically and culturally diverse. Therefore, teacher learning becomes a critical link in supporting this diversity through educational reform and systematic improvement". However, the influences on the teachers' ICT practices were more extensive than

previously recognised. There were also influential ecosystems in other sectors, such as the resources and the bureaucratic ecosystems. These ecosystems are discussed next.

7.3.4. Resources and bureaucratic ecosystems: Issues with access, availability, and policy

The complexity of the situation with the position of ESOL in the New Zealand curriculum and issues such as recognition, funding, resourcing, and assessment were other reported influences on the selected ESOL teachers' ICT practices. This finding extends the literature when making a link with ESOL teachers' reported ICT practice in New Zealand. The ambivalent position of ESOL as "a subject or an intervention" and support and the related complexities that this causes in terms of recognition and funding in the schools has already been discussed by Franken and McComish (2003, p. 160). What is important is that even after more than fifteen years this situation still exists and does not appear to have improved. The ESOL teachers in the current study perceived their position in the schools as inferior or subsidiary to other mainstream teachers. Feryok and Barkhuizen (2008) also state that the low status of ESOL is still a problematic issue in New Zealand. Feryok and Barkhuizen argue that because ESOL teachers lack a position as a learning area, they are perceived to lack "epistemological authority". Therefore, they are compelled to "negotiate roles" for themselves in their interactions with teachers of other subjects.

Crosby and Townsend (2014) also identify similar concerns about the well-being of ESOL teachers in secondary schools in Auckland, where schools have the highest number of ELLs in New Zealand. As ESOL facilitators for the region they noticed that, due to the specific conditions associated with work conditions in ESOL, some of the teachers in the region had resigned or considered resigning. Studies in similar contexts also highlight similar attitudes towards ESOL teachers (Creese, 2000; Harper, De Jong, & Platt, 2008). For instance, in their study on the recognition of ESOL as a subject area rather than an intervention, Harper et al. (2008) observed

that policy in the state of Florida has marginalised ESOL teachers' disciplinary expertise and their professional qualification. This failure to acknowledge ESOL as a subject in which teachers must be highly qualified effectively denies its value and status as curriculum "content" and reinforces the common assumption that teaching ELLs requires little more than a set of pedagogical modifications applied to other content areas.

In New Zealand, ESOL underwent a significant shift in its position in the revised version of the curriculum in 2007. Franken and Smith (2006) in their discussion paper about the 2007 curriculum while it was a draft, argue that although attention is given to the meta-curriculum characteristic of ESOL (something that was missing in the 1994 curriculum), the place of ESOL in the 2007 curriculum is not clearly recognised.

The ESOL teachers in the study reported that the funding situation for ESOL programmes and students was also complex and involved many bureaucratic processes and cost them much time and energy. ESOL was funded from a variety of sources such as Ministry of Education ESOL funding and from funding generated by fluctuating numbers of international fee-paying students. However, there appeared to be no official guidance on how schools best manage their expenditure for ESOL. This placed ESOL teachers in a vulnerable position in which they were discriminated against when compared to other subject areas in the school, particularly in relation to ICT infrastructure and resources for ESOL. This is important as there is a direct relation between a teacher's access to ICT resources and his or her ICT integration. Becker, Ravitz, and Wong (1999) noted that the frequency of computer use was significantly related to the location and number of computers in a classroom. Meskill, Anthony, Hilliker-Vanstrander, Tseng, and You (2006) also report a direct relationship between the convenience of immediate and in-class access to ICT and ESOL teachers' frequency of ICT use. Other studies also highlight the lack of hardware, software, and financial and technical support as one of the most common factors

restricting teachers from ICT integration and use (Jones, 2004; Nikolopoulou & Gialamas, 2016). This was a common challenge reported by the ESOL teachers in this study who found computer labs and COWs challenging and sought more access to computers in their ESOL classrooms.

Brown and Chamberlain's (2009) report on national policies on ICT practices in New Zealand education emphasised the increasing importance of access to sufficient ICT infrastructure as a prerequisite and a critical variable for integrating ICT in New Zealand schools. The presence of BYOD was regarded as a way to support the teachers by adding extra infrastructure to the classroom and making technology an integral part of the classroom (Talmo, Einum, & Støckert, 2014). However, this may not be a solution for ESOL programmes, since, as reported by the teachers in this study, BYOD imposes extra costs on parents and some of the ELLs come from low socio-economic circumstances. Similar findings were concluded in an OECD (2018) report. Limited access to ICT infrastructure and the inconvenience of BYOD demotivated teachers with regard to ICT integration.

In addition to the difficulty of accessing infrastructure and hardware, ESOL teachers reported finding suitable software for their students a major challenge. Despite the rapid development and integration of CALL tools in the field of language learning, ESOL teachers reported difficulty in finding appropriate content for their ELLs due to their very diverse needs. This confirms Franken and McComish's (2003) emphasis on the differences between teaching of English as a second language and a foreign language, and supports their recommendation for the development of CALL materials relevant to New Zealand. As reported by the participants, the teaching material for many English language courses are a range of ready-made books with main focus on general language skills. However, general language skills were not so relevant for ESOL classrooms and the content of ESOL required that resources be developed or modified by teachers so as to accommodate the needs of their ELLs including their NCEA and IELT exams.

Examination bodies were also reported to influence ESOL teachers' classroom practices. The findings of this study indicate that both positive and negative wash-back effects of the New Zealand National Certificate of Educational Achievement (NCEA) assessments influenced the teachers' choice of content and also their use of digital tools in the classroom. Alderson and Wall (1993) describe the wash-back effect of examinations on teaching and learning and argue that "tests are held to be powerful determiners of what happens in classroom" (p. 5). The ESOL teachers explained that except for some international exchange students, success in all three levels of NCEA exams was the main aim of the majority of ELLs in New Zealand high schools. Although this could be seen as a good motivator for students to try harder in order to enhance their language skills, it also had implications for the content and pedagogy in the ESOL classroom. These findings support Bedford's (2003) study on the effects of NCEA assessments on ESOL teaching and learning and also include its influence on ESOL teachers' ICT practices. Bedford argued that the NCEA assessments have both positive and negative washback effects. They positively enhanced ESOL's value and recognition in the school and amongst the ELLs and increased their motivation for and focus on their English language learning programmes. However, they also had a negative impact on the teaching focus, as the assessment, its rubrics, and restrictions on the use of digital tools, could influence ESOL classroom content and pedagogy. The teachers reported the latter as influencing their ICT integration since the amount of content the teachers need to cover is sometimes so much that it does not allow for ICT integration. In addition, National exams and language exams such as IELTS are still paper based, so the students need to develop the skills which could help them succeed in these exams. Although digital assessment is underway and aims to be available for all subjects by 2020 (New Zealand Qualifications Authority, 2018), according to the teachers and experts consulted, the move to transform paper-based assessment must be highly complex and, as such, relevant support for ELLs would be an additional complication. The New Zealand Qualifications Authority

(NZQA) is the authority in charge of managing the New Zealand Qualifications framework, administering and supervising all secondary school assessment and qualifications in New Zealand and ensuring their quality and credibility in the national domains (New Zealand Qualifications Authority, 2018).

Finally, Davis's (2018) Arena framework proved an effective methodology to map the evolution of ESOL teachers' behaviour with their students and their families, the teacher and the professional sector, and the teacher and the bureaucracies and resources. However, quite surprisingly, none of the teachers referred to any political influences. As discussed earlier, the position of an ESOL teacher is dependent on the presence of ELLs attending that school (Franken & McComish, 2003) and the number of ELLs is influenced in part by international and national policies. For instance, decisions on the refugee and migrant quota each year and the settlement laws and visa restrictions for immigrant workers and international students must have a direct impact on the number of potential ELLs entering schools and, therefore, indirectly on ESOL teachers' profession, course content, their recruitment and the variation in their contract hours and/or tenure. The application of Davis's (2018) Arena framework led to the identification of the influence of these bodies and policies on ESOL teachers, which is a novel research finding that deserves follow-up.

7.4. Implications and recommendations

The main implications of the findings in this research study are presented in three areas: theoretical implications, practical implications, and methodological implications. These are explained below and recommendations are made for practitioners, policy makers, and researchers.

7.4.1. Theoretical implications

Change is a chaotic and hard-to-predict process. The Arena framework helps to clarify the increasing complexity and diversity that occurs when things change and evolve with the introduction of an innovation. When an innovation is introduced, it creates ripple effects. The Arena's holistic approach to analysis through mapping in the layered ecosystems can help improve interpretation and predict the patterns of change (ripple effects) across the interacting ecosystems. By adopting the Arena framework, this study illustrates the diversity and complexity that exists in ESOL teachers' behaviour by presenting the findings in a visual and connected way. It suggests that the Arena and its ecological perspective can be used as a suitable theoretical framework to conceptualise and map the range of influences on ESOL teachers' ICT practices.

It should also be recognised that an ICT innovation may be planned or unplanned. Cyberbullying can be a by-product of ICT use and an example of where the ripple effect on individual ESOL teachers can be very different. This can be illustrated by contrasting two teachers who have been described in vignettes within this study to predict the individual nature of such evolution. For example, in Jean's case, cyberbullying might cause so much additional stress and disruption that she might decide to either completely abandon the use of ICT or leave teaching. In the contrasting case, Fred would be more likely to take a technical approach to assist in the management of the cyberbullying at the request of his senior management team.

Moreover, the findings of the study support the concept of keystone species, e.g., the teacher in the classroom ecosystem and the manager in the administrative ecosystem, and the ecosystems and the evolution and co-evolution between and among them as having the most explanatory power. Using the Arena, the findings suggest that the teachers' willingness to learn and change was a key factor in their progress towards ICT uptake and use or rejection, and their actual behaviour was strongly driven by their concerns as well as the coherence among and within the

ecosystems that they inhabit. These concerns need to be acknowledged and addressed in order to optimise ICT integration in the complex ecosystems in which ESOL teachers work in as well as related ecosystems abroad. For instance, Jean, Fred, and Amy were all willing to accommodate change. However, Jean stopped using ICT as she did not find coherence among available ICT resources, her students' needs, and the support from the management. In the case of Fred, his behaviour evolved over time (mapped in a series of Arenas) and varied with the behaviour of the administrative ecosystem. In the case of Amy, we can see that the ICT cloud in her Arena diagram does not extend into the ESOL classroom while it is over her technology and foreign language classrooms. As a keystone species, this indicates that Amy made a professional decision not to use ICT resources because ICT did not fit the needs of her ESOL students.

7.4.2. Practical implications

The findings of this study also provide some practical insights for ESOL teachers, administrators and leadership in the schools, policy-makers, PLD providers, and researchers who are involved in the use of ICT in New Zealand ESOL contexts and in similar contexts abroad.

ESOL teachers. Given that many ESOL teachers work in challenging ecosystems, it is important for them to realise as a keystone species in their educational ecosystems, that their own willingness to change with ICT has a considerable impact on their progress towards change. Hence, it is recommended that they take a proactive role and optimise their ICT use/rejection by reflecting on their personal concerns, developing TPACK knowledge, and evaluating their own practices.

Reflection on their individual contextual concerns may help the teachers to arrive at a better understanding of those personal and professional concerns and enable them both to make better decisions and to communicate the latter to other influential people within and beyond their school.

In relation to TPACK (Koehler & Mishra, 2009), ESOL teachers need to have a comprehensive understanding both of its constituent concepts and of the concept as a whole. For example, the ESOL "content knowledge" is very dependent on the needs of the teachers' particular learners. In the case of these selected ESOL teachers, they had to both teach form (language) to their ELLs and help them with content (other subjects' teaching). Hence, in addition to the need to have both an implicit and explicit knowledge of general English language, the necessary "content" knowledge would also include a knowledge of the other subjects in their school and the knowledge of the accompanying specific technical vocabulary and academic language knowledge (EAP and ESP). Furthermore, because of the diversity in each teacher's ESOL students and their study context, the teachers also need to be equipped both with a certain degree of knowledge of national culture (e.g., Aotearoa New Zealand) and knowledge of other cultures (this includes ICT cultures). Given the fact that ESOL teachers have some pastoral care duties, they also need to have some knowledge in this area as well.

In terms of pedagogical knowledge, ESOL teachers also to attend to a diverse range of students' needs but the hours allocated to ESOL for each student are very limited. Therefore, an ESOL teacher needs to prioritise some tasks over others and make deliberate and appropriate pedagogical decisions. Taking into consideration the special conditions outlined, an ESOL teacher might decide that using ICT is not an appropriate fit to his/her classroom pedagogy and therefore make an informed decision not to use it. In particular, this study has identified that there is a high degree of diversity in terms of ESOL learner profiles (as determined by factors such as socio-economic and linguistic background and technology availability) and this appears to prompt ICT-using ESOL teachers to regulate the amount of technology use. The contrast in Amy's practice between her languages and technology classrooms and her ESOL classrooms illustrates just such a complexity. The use of second language pedagogical principles such as

Nation's (2007) can help the teachers to plan their lessons and guide them in their ICT integration pedagogy. Cunningham's (2017) application of Nation's (2007) second language pedagogical principles (presented in Table 2.1) is an example of blending ICT and pedagogy to create a flipped language classroom.

It is recommended that teachers include ICT knowledge as part of their professional development plans. This may be done through utilising formal learning programmes and also by following research in this area. Focusing on ICT in their self-study and their teaching-as-inquiry projects and attending conferences on this topic can contribute to their knowledge development. In addition, purposeful communications with experts and other users of ICT such as colleagues teaching ICT, English and World Languages teachers, technicians, and other peers can increase a teacher's awareness of ICT tools and optimise her/his classroom pedagogy.

Administrators and leadership. This study provides insights for the secondary school management by illustrating the complexities and challenges that ESOL teachers face in their schools. It is important for school leaders and managers to realise that reducing the challenges would improve the coherence between and among ecosystems. The coherence between the ESOL ecosystem and the school's ecosystems can be improved by ensuring school management appreciate the complex nature of the ESOL ecosystem. Furthermore, optimising the communication between ESOL teachers, managers, administrators, and other teachers in the school is likely to improve coherence, bring a sense of recognition to ESOL teachers, thus reducing their feelings of isolation and offer them opportunities to voice their challenges and concerns, and those of their students. Greater awareness of ESOL teachers' concerns and challenges would enable school managers to make better-informed decisions about various aspects of ESOL in their schools such as budgeting, ICT resourcing, PLD, and ELL issues.

Policy-makers. This study illustrates how some of the policies and initiatives implemented at the national and international levels may directly or indirectly influence ESOL ecosystems. As stated earlier, there are ripple effects with innovations and the Arena framework enables these to be perceived more clearly. In other words, when things change and evolve, they change to become even more complex and diverse. The Arena's holistic approach to analysis may assist policy makers and other leaders in predicting the effects of a policy ripple across interacting ecosystems and also to identify living and non-living matter involved. Reaching out to ESOL teachers, hearing their voices and input, and reviewing the implicit and explicit consequences of policies on marginalised areas such as ESOL can help to improve the implementation of policy. This also applies internationally, given the need for alignment, as discussed in the integrative review in which I contributed the evidence on Aotearoa New Zealand and Iran (Butler et al., 2018).

ITE and PLD providers. This study offers ITE and PLD providers insights into the lack of coherence between professional ecosystem and ESOL ecosystem. The lack of opportunities for ESOL teachers in their ITE and PLD may be improved by providing relevant, specialised, and contextualised PLD for ESOL teachers. Short-term specialised and practical online workshop and webinars which are flexible in time and place can be one possible solution, because the population of ESOL teachers is widely dispersed.

The findings have also outlined a range of ESOL teachers' concerns and challenges. Hence, it is recommended that these concerns be addressed when designing future ITE and ICTPLD. This includes provision of PLD programmes that respond to the variations in teachers' learning pace as well as providing sufficient mentoring and follow-up programmes to help teachers to improve their computer self-efficacy and ICT integration. In addition, Nation's (2007) pedagogical principles can be used to design a syllabus through which ICT roles and functions in second language pedagogy can be introduced to update language teachers' pedagogy.

7.4.3. Methodological implications

This study provides some methodological contributions by recommending the use of Nation's (2007) pedagogical principles, Davis's (2018) Arena framework, Davis's (2018) synthesis of concerns-based models, and cautioning against the use of SAMR as an analytical tool.

The findings of this study suggest Nation's (2007) pedagogical principles as a suitable analytical tool for researchers to analyse the pedagogical functions of ICT tools in an ESOL classroom. It can also assist researchers in identifying the compatibility of ICT tools with second language pedagogy and how these can best be integrated into the language classroom.

Davis's (2018) Arena framework helps to present findings in a visual and connected way, hence making it a suitable framework and theoretical lens for researchers who are studying ICT integration in complex educational contexts such as ESOL. This study provides detailed illustration and explanation on how the Arena framework can be used to clarify the interactions between different interacting ecosystems. The mapping of the vignettes into the Arena framework indicates high levels of diversity in ESOL teachers' behaviour due to the complex range of influences from interacting ecosystems. Hence, researchers should expect high levels of diversity and complexity in their research and plan their methodology accordingly. For example, if this study had been designed from the outset using the Arena framework, the focus then would have been on the Arena and the evolution and the co-evolution of the interacting ecosystems. Furthermore, considering the diversity in teachers' behaviour, implies that it is hard to find a representative sample in complex environments. As such, a purposive sampling with fewer but contrasting cases could have been attempted. More types of participant (species), i.e., the people from the bureaucratic and professional sector would also have been considered. In addition, interview questions would have focused on different sectors of the Arena, making the research approach more deductive rather than inductive. Some of the questions then would have focused

on the influences of school culture on teachers' practices, challenges involved for ESOL PLD and the existing policies. However, it is worth mentioning that if the Arena had been used from the start, then I would not have been listening so openly to what the teachers had to say and I might have been imposing interpretations on them.

Despite the benefits, there are also limitations to the Arena. One of the limitations of the Arena as an analytic tool is that it is hard to map abstract concepts and factors that include a teacher's cultural and other knowledge as well as his or her mental, emotional, and physiological state. According to Davis (2019, p. 142),

> Although the Arena framework conceptualizes change processes in terms of ecosystems, that conceptualisation does not provide us with a model that allows us to predict the ways in which behaviour within the educational ecosystem will change under various conditions. Bringing in concerns-based modelling into the ambit of the Area allows us to fill that "gap".

Thus Davis (2019) recognises that additional models can be integrated within the Arena framework to conceptualise a process such as professional development. This study acknowledges the benefits of the use of Davis's (2018) synthesis of concerns-based models as an analytical tool to help researchers to better analyse and understand their participants, particularly regarding their concerns at the time when a teacher is working to change their pedagogy in order to integrate ICT into their ESOL teaching practices.

Finally, the findings of this study caution against the over-use of e-maturity models such as SAMR (Puentedura, 2013). SAMR has been one of the most frequently used frameworks for ICTPLD in this country and has prompted leaders of ICTPLD, teachers, and researchers to assess the maturity and efficiency of teachers' ICT integration. The findings suggest more caution when

using SAMR (Puentedura, 2013) to evaluate an ESOL teacher's level of e-maturity with ICT tools. This is because SAMR does not take account the affordances of ICT in relation to the wider context in which ICT tools are used because the techno-centric nature of this model can distract from more relevant aspects of language learning and/or pastoral support by an ESOL teacher (e.g., Amy's rejection of ICT in her ESOL classroom). In addition, digital tools evolve and co-evolve with time so that change with ICT is an "ongoing evolutionary process" which varies across different contexts (Davis, 2018, p.78). Hence, it is recommended that researchers, ESOL teachers and those involved in their PLD be cautious when using SAMR and that they pay attention to the teachers' contexts, particularly when considering its fourth stage as the ultimate level of ICT integration. Forced implementation of such e-Maturity frameworks as SAMR may result in added stress for ESOL teachers and may bring about unhelpful feelings of lack of accomplishment and dissatisfaction.

7.5. Limitations of the study and directions for future research

This research study has some limitations, such as the age of the data, participant sampling, and method of data collection, which are briefly outlined below.

The first limitation is the age of the data, which was collected in the years 2013 and 2014. The age of the data may limit its applicability, due to the rapid evolution of ICT in educational contexts. However, since this data was collected after the emergence of mobile technologies, many schools in New Zealand and abroad are likely to still be operating under similar conditions so that there will be resonance with these findings. Another issue related to the age of the data is the changes in the educational policies in New Zealand. Since 2014, there have been some changes in regard to ICT policies, assessment policies, and attention to minority students at the national level, which may have addressed some of the shortcomings discussed in relation to ESOL context in this study. Policies such as "Towards Digital Fluency" (Ministry of Education,

2015c) launched a year after the collection of the data in 2015, is one example. This policy places particular emphasis on improving school ICT infrastructure, promoting 21st-century teaching and learning, enhancing students' access to quality online content and resources, and providing equitable access to digital learning for every learner regardless of their location or family background. This policy may have resulted in improved conditions for ELLs as minority learners. However, follow-up conversations with the experts and correspondence with a number of the participants did not indicate any such change in their ESOL contexts. Further research into the possible impacts of such policies on the ESOL in the schools, as well as caution in interpreting and applying the results of this study is recommended.

The second limitation of the study concerns the participant recruitment and sampling method used, which limits generalisation to all ESOL teachers in New Zealand and ESOL teachers in other contexts. The majority of the participants were recruited through the ESOL Online forum. This left out the voices of possible participants who were not members of this platform. However, it should be noted that ESOL Online is an important forum for ESOL teachers who wish to stay in touch with others around the country. Furthermore, the study was confined to the data gathered from 21 secondary ESOL teachers in New Zealand. The data highlighted the views mainly from a female perspective, due to the higher number of female teachers who volunteered to participate in the study. However, according to Haddock (1998), the majority of ESOL teachers in New Zealand appear to be female, so the participants could be a small sample that is representative of the gender of the population of ESOL teachers in this country. To aim for diversity a more purposive sampling, as opposed to the study's pragmatic sampling, would have allowed deeper understanding through exploring fewer but contrasting cases.

The third limitation concerns the research method and number of sources of the data. There is only one principal source of data, which is the teachers' self-report of their ICT practices and

what influences their practices. Therefore, some of the accounts the teachers provided may be biased, or given as an excuse for justifying their ICT-related practices. Some possible alternative or additional data collection methods could have included classroom observation, and /or giving the teachers an opportunity to self-assess their ICT knowledge and level of ICT practices through survey. Direct classroom observation could have enriched the findings and provided insights on teachers' perceptions of their own practices and their actual practices. However, as discussed in Chapter Three, observation was not possible due to physical distance and anonymity issues. Indeed, the addition of multiple sources of data (Creswell, 2013), including interviewing more types of participants (species) such as the school leadership, other teachers in the school, PLD providers, and ELLs would have further contributed to this study. However, the inclusion of all these voices was beyond the scope of this study.

Finally, as an international doctoral student, I was neither familiar with nor had any prior experience and knowledge of ESOL practices within the New Zealand educational system. This lack of familiarity has increased the risk of my accepting the teachers' responses at face value, which, in turn, might have affected the interpretation and reporting of the data. Nevertheless, attempts were made to reduce this limitation by including voices from some experts, such as a number of language teacher educators, an ESOL facilitator, and analysis of a selected number of relevant policy documents.

7.6. Concluding remarks

As a researcher, at the start of this study I was not completely familiar with the complexities peculiar to ESOL context and the way in which they continue to evolve. I am now much more aware of the diversity and complexities that occur in these and other language teaching contexts, including those in my home country (e.g., Butler et.al, 2018). In this way, my thesis can help

others who have less appreciation of the complexities and challenges that come with ICT integration providing better insights into their contexts.

ICT will continue to permeate educational ecosystems (Davis, 2018) and teachers will continue to be expected to integrate ICT into their teaching and learning. This study is particularly relevant to the current New Zealand context and ESOL teachers who play a crucial role in supporting the needs of the growing number of ELLs in New Zealand schools, as the result of migration and the growth of the international student recruitment industry.

The findings of this research gave voice to ESOL teachers who have often been undervalued in New Zealand, as elsewhere, by describing the very complex ecosystems in which they work. The study provides evidence of the increasing complexity of educational systems for ESOL teachers who must work across the secondary school curriculum. As systems became more complex, the situation of ESOL teachers who are expected to work across the curriculum and integrate ICT in their pedagogy can become unduly complex and stressful. Hence, to enable change and a quality education for ELLs and their ESOL teacher, greater coherence between different professional, resources, political, bureaucratic, and family ecosystems both nationally and globally is required.

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Appendix A

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UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information Sheet for Teachers

Project title: A Study of Influences on ICT Practice(S) of ESOL Teachers in New Zealand Secondary Schools

As part of the study, I would like to examine ESOL teachers' perspectives towards ICT and the factors that contribute to their use or lack of use of educational technologies in their professional life. Furthermore, I would like to explore the extent to which teachers believe in and identify with dichotomies such as 'digital native', 'net-generation' and 'digital immigrant,' which are the labels which segregate the young tech-savvy generation from parents and teachers. Data will be gathered, with your informed consent, interviewing you on your experiences and impressions regarding the accuracy and implications of such labellings on you, your profession, your work place and society.

Your involvement in the project will include an interview on your perceptions on the factors that influences your ICT use in the school. The interview will take about 40 -60 minutes and will be audio recorded. It will be carried out in a place and time that best suits you. You may request the recording to be stopped temporarily or permanently if at any time you feel uncomfortable. As the principal researcher, I will conduct and transcribe the interview. You will be provided with a copy of the interview transcript for approval. Your participation is voluntary and you have the right to withdraw from the project at any time without penalty. If you choose to withdraw, I will use my best endeavours to remove any of the information relating to you from the project, including any final publication, provided that this remains practically achievable.

All information will be treated in strictest confidence, all participants will remain anonymous. All data will be kept by me as the researcher and any data that can identify the participants will not be given to any other researcher or agency. As required by the University's research policy, at the completion of the project all information collected will be retained in secure storage for five years, after which it will be destroyed. The results of the study may be submitted for publication to national or international journals or presented at educational conferences. You may at any time ask for additional information or results from the study. Reasonable precautions will be taken to protect the privacy of data transmitted through the Internet.

If you would like more information or have any questions about the research, you can contact me or my supervisor Dr Ronnie Davey (Ronnie.Davey@canterbury.ac.nz). If you have any concerns or complaints about this research, please contact: The Chair, Educational Research, Human ethics committee, University of Canterbury, Private Bag 4800, Christchurch, Email: human-ethics@canterbury.ac.nz

If you are happy to take part you will need to sign the consent form and return it to me. Please retain this information sheet. Thank you for your consideration of this research project.

Sara Farshadnia, (sara.farshadnia@pg.canterbury.ac.nz)
Phone: 0220217204

Appendix B

College of Education
School of Literacies and Arts in Education
Tel: +64 3 343 9606, Fax: + 64 343 7790

Participants Consent Form

Project Title: **A Study of Influences on ICT Practice(S) of ESOL Teachers in New Zealand Secondary Schools**

I understand the aims and purposes of the research study undertaken by **Sara Farshad Nia.**

- The study has been explained to me and I understand the information that was given to me on the information sheet.
- I am aware that my participation in this project is voluntary. I have had all questions answered to my satisfaction.
- I understand that my involvement will include an audio-recorded interview with the researcher on my experience regarding my viewpoints towards the new technologically delineated labels that differentiates the younger tech-savvy generation from those born earlier.
- I understand that I can withdraw without penalty from the study at any time, without giving any reason for withdrawing.
- I understand that all information will be treated in strictest confidence, that participants will remain anonymous and that no information that could identify me will be given to other researchers or agencies. I understand that reasonable precautions have been taken to protect the privacy of data transmitted through the internet.
- I understand that within these restrictions, the findings may be submitted for publication to national or international journals or presented at educational conferences; that the results of the study can be made available to me at my request and that I can request additional information at any time.
- I understand that interviews will be recorded and I can ask the recording to be stopped any time temporarily or permanently. I may be provided if I wish with a copy of the interview transcript to check for accuracy.
- I have read the information sheet and consent form. I agree to participate in the study.

Name
_____

Signature _____ Date
_____

Email _____ Contact Number_____

Please return this form in person or through e-mail to Sara Farshad Nia by <DD/MM/YYYY> (sara.farshadnia@pg.canterbury.ac.nz)

Appendix C

Interview Questions

Could you please introduce yourself, age, teaching experience, and teaching background?

In what ways are you currently using ICT in your professional life?

What are the ICT tools that you use?

What kind of Impacts do you think ICT has had on your professional life?

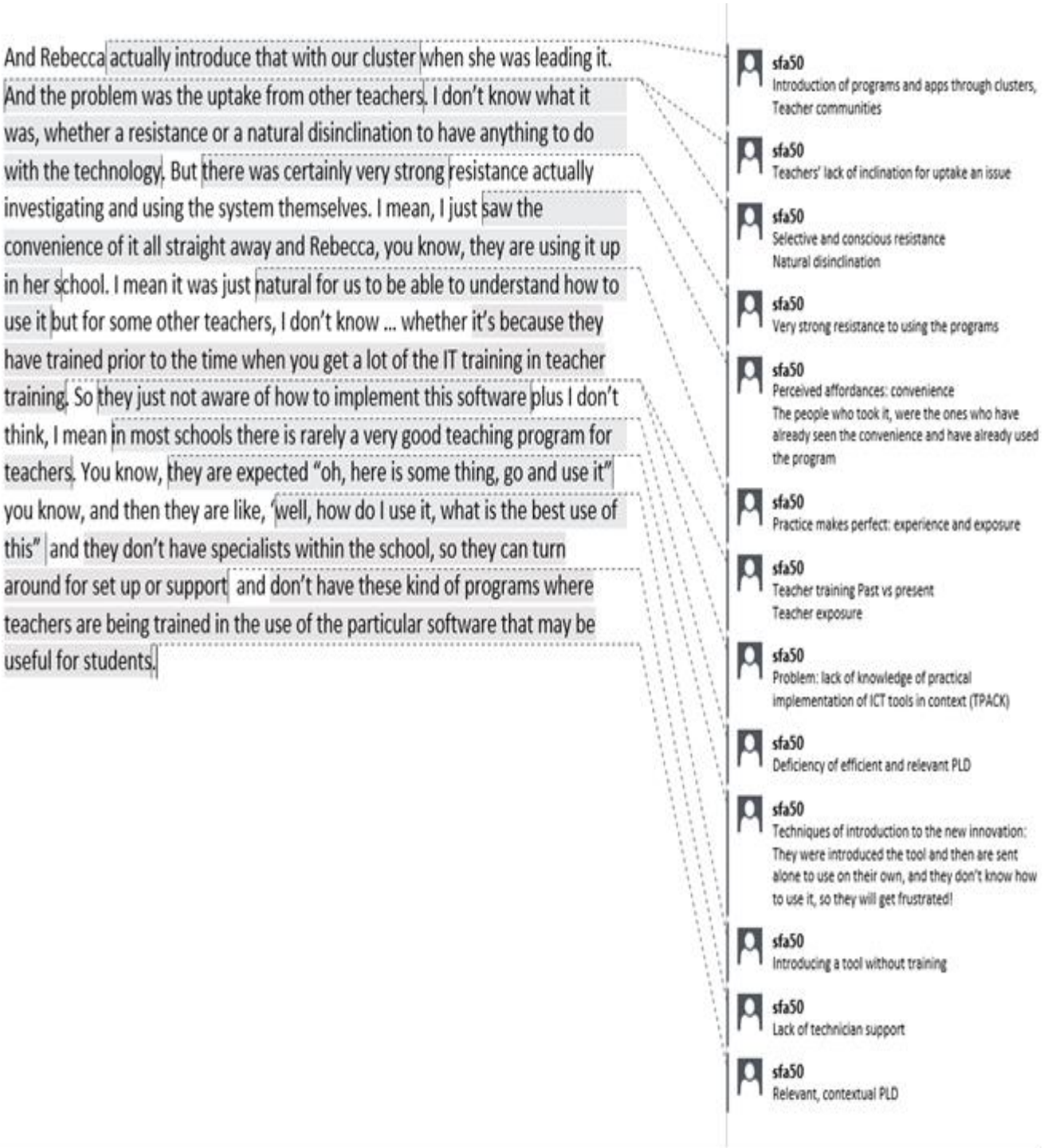
Where the initial drive come from?

What are the challenges to your ICT use?

What differences do you see between yourself and your younger/older colleagues in your ICT practices?

Appendix D

Sample of Close Coding of Interview Transcripts



Appendix E

A Screen-shot of the process of data analysis Nvivo